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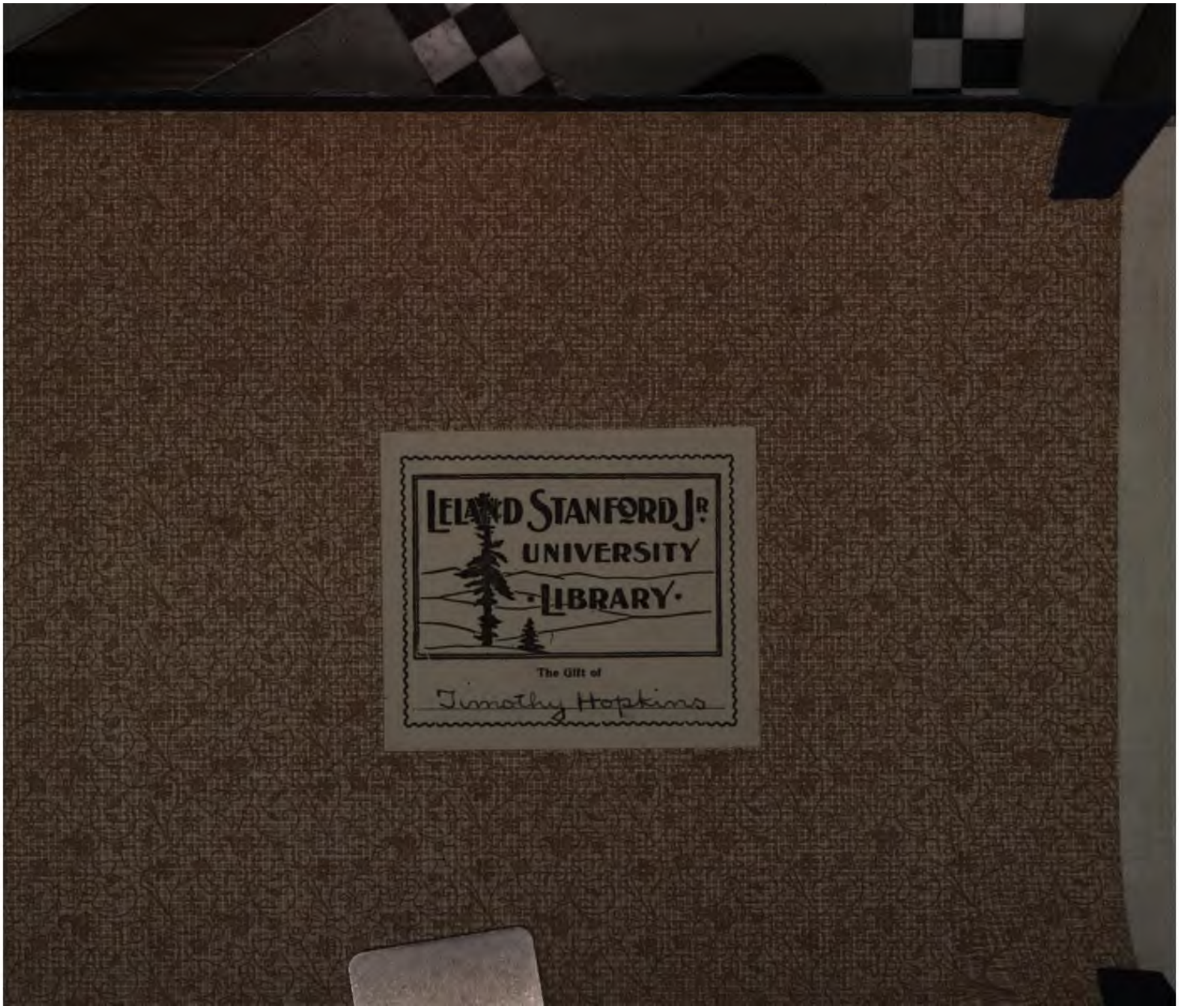
PACIFIC GAS AND ELECTRIC COMPANY

PROPERTIES OWNED AND OPERATED TERRITORY SERVED

FINANCES
HISTORY
STATISTICS

CALIFORNIA, U. S. A.
1911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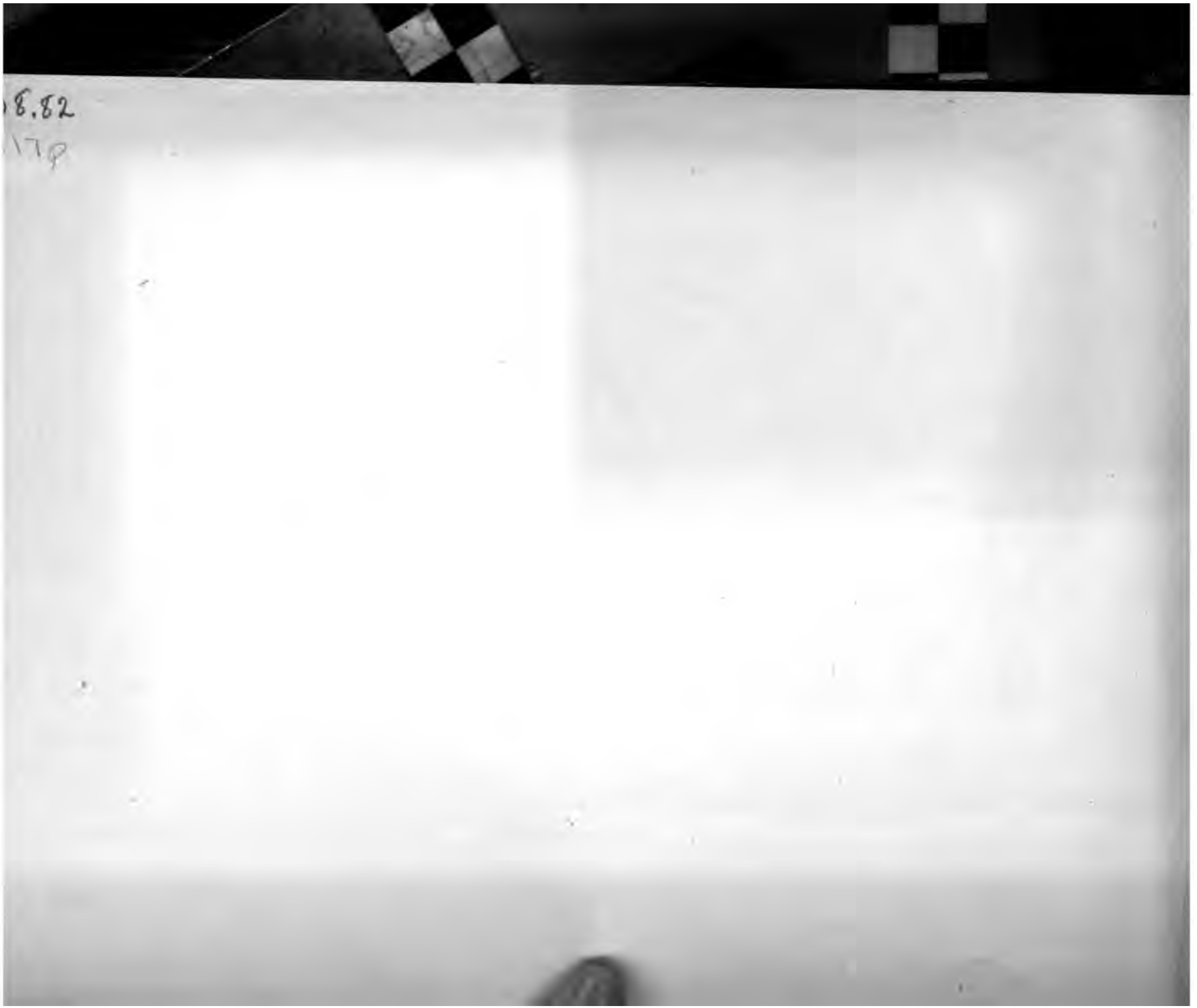
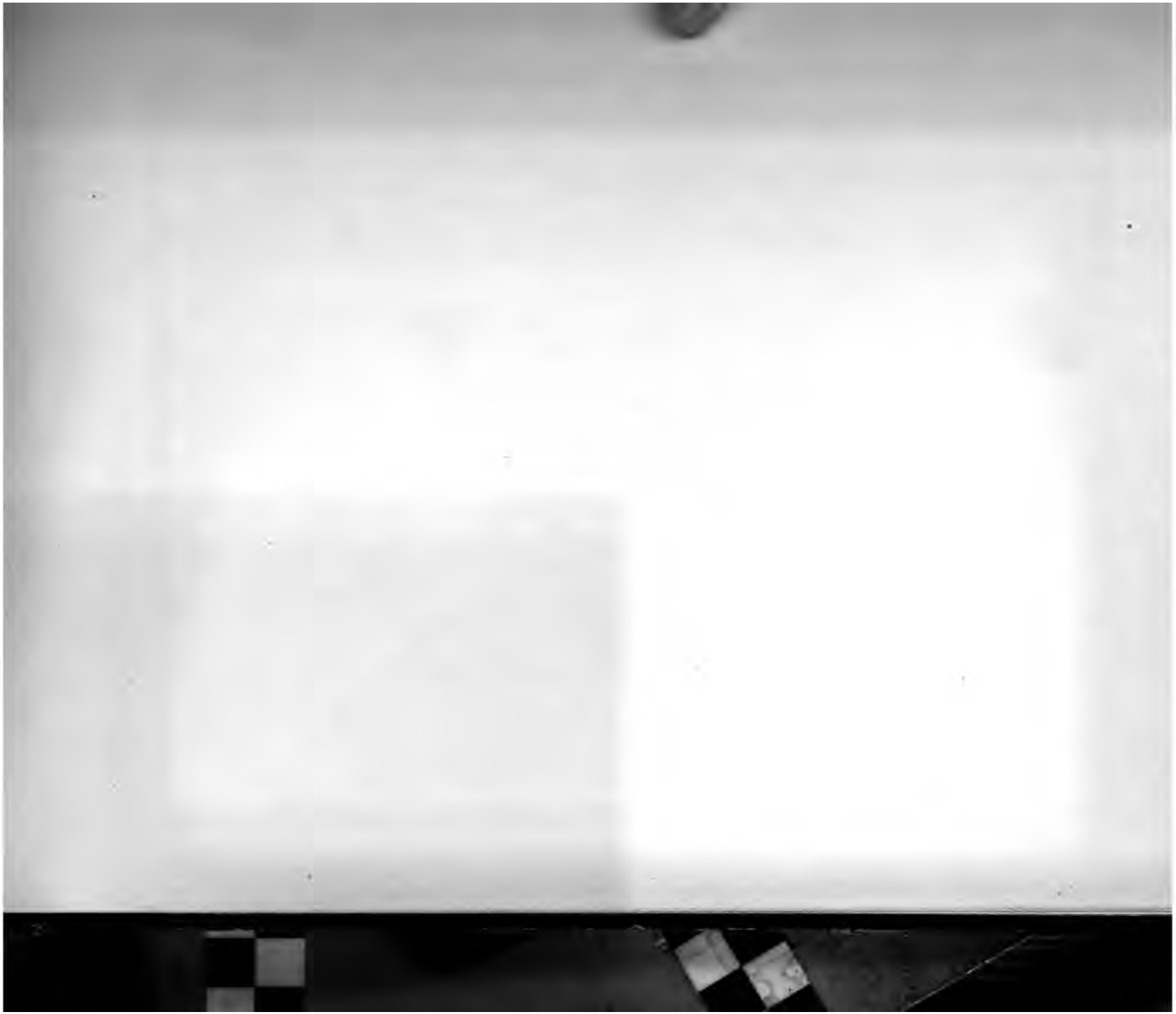


PACIFIC
GAS AND ELECTRIC
COMPANY



PROPERTIES OWNED AND OP

TERRITORY SERVED

PACIFIC GAS AND ELECTRIC
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CALIFORNIA, U. S. A.

1911

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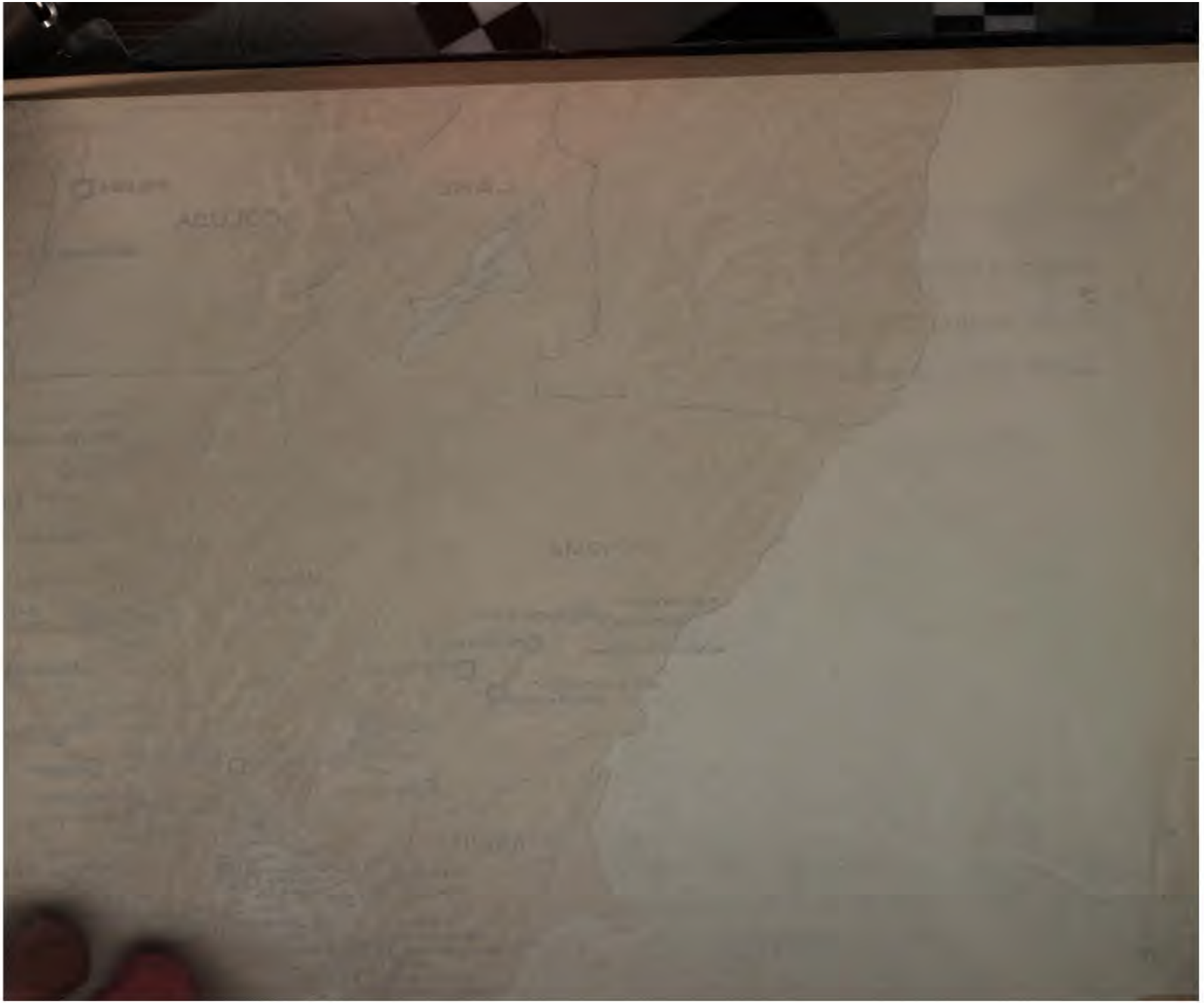

FINANCIAL

PACIFIC GAS AND ELECTRIC COMPANY

EARNINGS AND EXPENSES OF ALL COMPANIES FOR FIVE YEARS—1906 TO 1910.

		YEAR 1906.	YEAR 1907.	YEAR 1908.	YEAR 1909.	YEAR 1910.	*INCREASE 5 YEARS.*	DECREASE 5 YEARS.
1	GROSS REVENUE	$ 8,947,162.42	$11,342,140.08	$12,715,745.72	$13,650,075.28	$14,229,228.05	*$ 5,282,065.63*	.....
2	DEDUCT REVENUE IN SUSPENSE (San Francisco Rate Cases)	.....	.....	116,881.85	317,574.25	369,264.29	*369,264.29*	.....
3	GROSS REVENUE (Undisputed)	$ 8,947,162.42	$11,342,140.08	$12,598,863.87	$13,332,501.03	$13,859,963.76	*$ 4,912,801.34*	.....
4	MAINTENANCE	673,067.35	1,057,163.03	1,219,492.31	1,210,505.62	1,243,859.24	*570,791.89*	.....
5	OPERATING EXPENSES, Taxes and Reserves for Uncollectible Accounts, Casualties, etc.	3,750,051.72	5,169,065.60	5,573,226.94	6,321,070.27	6,677,481.76	*2,927,430.04*	.....
6	TOTAL EXPENSES	$ 4,423,119.07	$ 6,226,228.63	$ 6,792,719.25	$ 7,531,575.89	$ 7,921,341.00	*$ 3,498,221.93*	.....
7	NET REVENUE	$ 4,524,043.35	$ 5,115,911.45	$ 5,806,144.62	$ 5,800,925.14	$ 5,938,622.76	*$ 1,414,579.41*	.....
8	INTEREST, (Including Interest on Unifying and Refunding Bonds and on all other funded and unfunded debt)	$ 2,784,908.48	$ 2,854,264.06	$ 3,021,721.67	$ 2,988,521.70	$ 3,006,156.16	*$ 221,247.68*	.....
9	BALANCE	$ 1,739,134.87	$ 2,261,647.39	$ 2,784,422.95	$ 2,812,403.44	$ 2,932,466.60	*$ 1,193,331.73*	.....
10	DEDUCTIONS:							
11	Accrued Dividends on Preferred Stock	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00		.....
12	Sinking Funds	581,447.48	578,858.43	621,063.24	667,209.56	733,402.37	*151,954.89*	.....
13	Bond Dis. and Expense	.....	.....	44,258.89	42,236.95	47,220.00	*47,220.00*	.....
14	TOTAL DEDUCTIONS	$ 1,181,447.48	$ 1,178,858.43	$ 1,265,322.13	$ 1,309,446.51	$ 1,380,622.37	*$ 199,174.89*	.....
15	BALANCE	$ 557,687.39	$ 1,082,788.96	$ 1,519,100.82	$ 1,502,956.93	$ 1,551,844.23	*$ 994,156.84*	.....

(Analysis of above on following pages)

Gross Revenue (Line No. 3)

Gross revenues increased almost five millions of dollars during the five years from January 1, 1906, to December 31, 1910. A graphic presentation of this growth will be found on pages 26 and 27. It will be observed from these charts that there has been an uninterrupted growth from year to year and that all branches of the Company's business have had a healthy increase.

Maintenance (Line No. 4)

Visual evidence of the splendid physical condition of the Company's properties is presented in the photographic views reproduced in this booklet. This condition is a reflection of the liberal expenditures for maintenance. These expenditures for upkeep approximated one and one-quarter millions of dollars during 1910, and during the five years under review aggregated nearly five and a half millions of dollars.

Operating Expenses, Etc. (Line No. 5)

The Pacific Gas and Electric Company, in common with other public service corporations, has not escaped the universal tendency towards higher operating costs, and in 1910 it expended almost three millions of dollars more than in 1906 to carry on its operations. This increase was, in a large measure, due to the greater magnitude of its business—its sales of gas for example, increasing from three and one-half billion cubic feet in 1906 to five and a quarter billion cubic feet in 1910, and what is true of its gas department applies equally as well to its electrical and other departments.

There has also been a constant tendency to work on a closer margin of profit, due, in large measure, to the policy pursued by the Company for a number of years of steadily improving its service, and of voluntarily lowering its rates to consumers when conditions warranted it. The good-will enjoyed by the Company in the communities served by it has undoubtedly fully justified this liberal policy, which has been adhered to consistently, notwithstanding the higher cost of everything entering into the manufacture and distribution of its products.

Net Revenue and Interest (Lines No. 7 and 8)

The Net Revenues available for the payment of interest increased almost a million and a half of dollars during the five-year period. Concurrently, and notwithstanding very heavy outlays for additions, extensions and betterments to the property, there has been a comparatively small increase in the Company's fixed charges. It will be noted that while 61.5% of the Company's Net Revenue was required in 1906 to meet these obligatory charges, it required in 1910 but 50.6% of Net Revenues to pay the interest on all of the Company's obligations, both funded and unfunded.

During these five years the aggregate expenditures for tangible additions to the plant have exceeded $17,000,000. The concurrent increase in the total par value of interest bearing obligations in the hands of the public, exclusive of securities exchanged, was less than $6,000,000.

The reasons for the slight increase in interest charges, compared with the growth of net earnings, may be summarized as follows:

(a) Lower average rate of interest paid on the Company's obligations; this average rate of interest in 1906 was 5.10%, and in 1910, 4.98%.

(b) Retirement and cancellation of bonds through sinking fund payments made from earnings, the par value of bonds so cancelled during the five years aggregating $2,513,405. In addition, bonds of the par value of $1,140,000 were purchased for sinking funds and not cancelled. While the interest on these uncancelled bonds has been accruing to the benefit of the sinking funds, it is nevertheless included in the fixed charges shown in the statement which is the subject of this analysis.

(c) To the application of earnings for additions, extensions and betterments of the plant.

General

As indicated in the preceding paragraph, the Company, for a number of years, has followed the policy of strengthening its position by devoting its surplus earnings, on the one hand, to the upbuilding of its properties, and, on the other hand, to the reduction of its debt. This has resulted in the creation of a large equity in excess of the Company's funded debt. While it is difficult to definitely fix the exact replacement value of these properties, estimates made by competent engineers place it somewhere between ninety and one hundred millions of dollars, exclusive of good-will, franchises, and other intangible items. This represents a minimum equity of more than thirty-two millions of dollars in excess of the total par value of all of the Company's bonds issued and outstanding in the hands of the public at the close of 1910.

PACIFIC GAS AND ELECTRIC COMPANY—ALL COMPANIES

CONSOLIDATED GENERAL BALANCE SHEET

DECEMBER 31, 1910.

ASSETS

CAPITAL ASSETS		
Plant and other Property		$109,570,940.70
CURRENT ASSETS		
Free Treasury Securities (Market Value in excess of $2,250,000.00)	$2,099,615.66	
Cash	410,430.68	
Consumers' Accounts and Notes Receivable	1,112,777.39	
Materials and Supplies	1,162,477.49	$ 4,785,301.22
DEFERRED AND CONTINGENT ASSETS		
Insurance, Taxes, etc., paid in advance	$ 85,797.38	
Cash impounded in San Francisco Rate Cases	759,047.59	
Alive Bonds and Cash in hands of Trustees of Sinking Funds	1,504,325.82	$ 2,349,170.79
DEFERRED CHARGES		
Bond Discount and Expense (To be prorated over life of bonds)	$1,260,060.55	
Maintenance and Operating Expenses	6,809.03	$ 1,266,869.58
		$117,972,282.29

PACIFIC GAS AND ELECTRIC COMPANY—ALL COMPANIES

CONSOLIDATED GENERAL BALANCE SHEET

DECEMBER 31, 1910.

LIABILITIES

CAPITAL LIABILITIES				
STOCK—Common	In hands of Public	$19,272,500.00		
" "	In Treasury	727,500.00		
			$20,000,000.00	
" Preferred	In hands of Public		10,000,000.00	$30,000,000.00
BONDS OUTSTANDING IN HANDS OF PUBLIC, viz;				
P. G. & E. Co.			$12,701,975.00	
C. G. & E. Corporation Unifying and Refunding		$14,498,000.00		
" " Underlying Bonds		21,009,000.00		
			$35,507,000.00	
S. F. G. & E. Co. and Sudsidiaries			9,200,000.00	
TOTAL BONDS IN HANDS OF PUBLIC (Details on pages 14 to 25)			$57,408,975.00	
Bonds held in Sinking Funds (Details on pages 14 to 25)			1,486,000.00	
Bonds held in Treasury			1,799,028.87	
Bonds due Treasury from Trustees for Construction to date			399,000.00	$61,093,003.87 $91,093,003.87
CURRENT LIABILITIES				
Bond Interest and Sinking Funds Accrued but not yet due				$ 870,969.37
Consumers' Deposits				312,895.19
Notes Payable (See Foot Note)			$ 1,811,666.66	
Current Obligations for Materials and Supplies, Pay Rolls, etc.			908,555.31	$ 2,720,221.97 $ 3,904,086.53
OTHER LIABILITIES				
Earnings in Suspense acct. San Francisco Rate Cases			$ 818,256.65	
" " " P. G. & E. Co.			3,205.32	$ 821,461.97
Sundry Items				154,918.20
SURPLUS AND RESERVES				

NOTE: Sufficient Bonds since sold to pay this floating debt.

STATEMENT OF BONDS IN SINKING FUNDS AND IN

PACIFIC GAS AND ELECTRIC COMPANY ISSUES

ISSUES.	DUE.	INTEREST.		PAR VALUE OUTSTANDING.		
		WHEN PAYABLE.	WHERE PAYABLE.	IN SINKING FUNDS.	HELD BY PUBLIC.	TOTALS.
1. Genl. Mtg. & Coll. Tr. 5's...	1-2-36	J2 & J2	Union Trust Co., San Francisco.	.....	$ 8,817,975	$ 8,817,975
2. Debenture Mtg. 6's.....	12-15-37	J15 & D15	N. W. Halsey & Co., New York. Office of Company, San Francisco.	.....	$ 3,884,000	$ 3,884,000
Total Pacific Gas and Electric Company Issues.....				.....	$12,701,975	$12,701,975

THE HANDS OF THE PUBLIC, DECEMBER 31, 1910

REMARKS.

Callable at 105 and Accrued Interest. Sinking Fund now $370,000 annually—applied to the purchase and cancellation of bonds of this issue. $1,324,405.00 so cancelled to date. In addition Sinking Fund now holds $252,152.77 cash, which, on March 27, 1911, will be applied to the further purchase and cancellation of bonds.

Callable at 100 and accrued interest. Sinking Fund March 1, 1918, to and including 1927, $125,000 annually; 1928 to 1937, inclusive, $250,000 annually.

These two bond issues, in the order here given, are liens upon all of the stock of the San Francisco Gas and Electric Company, now owned or hereafter acquired by the Pacific Gas and Electric Company; also upon all of the physical properties owned by this Company outside of San Francisco, subject, however, as to these properties, to the prior lien of the Unifying and Refunding Bonds of the California Gas and Electric Corporation, and issues prior thereto, shown at numbers 4 to 20, inclusive.

CALIFORNIA GAS AND ELECTRIC CORPORATION ISSUES

ISSUES.	DUE.	INTEREST.		PAR VALUE OUTSTANDING.		
		WHEN PAYABLE.	WHERE PAYABLE.	IN SINKING FUNDS.	HELD BY PUBLIC.	TOTALS.
3. Unifying and Refunding 5's.	11-1-37	M1 & N1	N. W. Halsey & Co., New York. Office of Company, San Francisco.	.....	$14,498,000	$14,498,000

REMARKS.

Outstanding in the hands of the public		$14,(
Held in Treasury (since sold)	$ 1,278,000	
Reserved for retiring underlying bonds in the hands of the public	21,009,000	
Reserved to retire bonds in sinking funds	1,195,000	
Available for future additions and betterments to the property at 85% of the cost of such construction	7,020,000	$30,
TOTAL AUTHORIZED ISSUE		$45,(

Subject to call for sinking funds at 110 and interest after November 1, 1912. Entire issue callable at same rate but only a of P. G. & E. Bonds at No. 1.

By deed of trust of the California Gas and Electric Corporation dated November 1st, 1907, and supplementary mortgage Gas and Electric Company executed concurrently therewith, these bonds are secured by a direct mortgage lien upon all the phy and other assets of these companies now owned or hereafter acquired (except the stock of the San Francisco Gas and Elect situated in the City and County of San Francisco and in the counties of:

Alameda	Butte	Contra Costa	Mariposa	Nevada	San Joaquin	Santa Cruz	Sutter	Stanislaus
Alpine	Calaveras	El Dorado	Marin	Placer	San Mateo	Solano	Sonoma	Tuolumne
Amador	Colusa	Fresno	Napa	Plumas	Sacramento	Santa Clara	Sierra	

The lien of the Unifying bonds is subject to underlying bonds in the hands of the public aggregating $21,009,000. All of s mortgages are closed, except where provision is made for the exchange of one underlying issue for another. The Unifying mortgag prior to the lien of the two issues of the Pacific Gas and Electric Company aggregating $12,701,975.

Since the issuance of the Unifying mortgage $7,793,000 of underlying bonds have been exchanged for Unifying and Re and deposited with the trustee of the latter issue as additional security. Underlying bonds are exchangeable for Unifying Bonds at p

The mortgage provides for a sinking fund as follows:

1912 to 1916 inclusive	$450,000	per annum	$ 2,250,00(
1917 to 1921 "	550,000	" "	2,750,00(
1922 to 1926 "	700,000	" "	3,500,00(
1927 to 1936 "	900,000	" "	9,000,00(
Aggregate payments to maturity, exclusive of interest accretions			$17,500,00(

These payments to be applied, initially, to the redemption of bonds for Sinking Funds of all underlying issues (Nos. 4, 5, 9, 1 balance to be applied to purchase of bonds of this issue.

During the past seven years the properties directly subject to the lien of the Unifying Bonds have had aggregate net revenue interest on such Unifying Bonds and underlying issues amounting to $22,037,281.63 as against total interest charges of $10,552,39 balance, after payment of this interest, of $11,484,886.34.

Listed on New York Stock Exchange.

[illegible] CORPORATION ISSUES—CONTINUED

	INTEREST.		PAR VALUE OUTSTANDING.		
[illegible]	WHEN PAYABLE.	WHERE PAYABLE.	IN SINKING FUNDS.	HELD BY PUBLIC.	TOTALS.
[illegible]	MI & SI	Mercantile Trust Co., San Francisco.	$ 808,000	$ 4,700,000	$ 5,508,000
[illegible]	MI & SI	Mercantile Trust Co., San Francisco.	$ 158,000	$ 1,735,000	$ 1,893,000
[illegible]	AI & OI	Union Trust Co., San Francisco.	$ 50,000	$ 700,000	$ 750,000
[illegible]	AI & OI	Union Trust Co., San Francisco.	.....	$ 171,000	$ 171,000
[illegible]	JI & DI	Mercantile Trust Co., San Francisco.	.....	$ 186,000	$ 186,000
[illegible]	MI & NI	Mercantile Trust Co., San Francisco. U. S. Mtg. & Tr. Co., New York.	$ 59,000	$ 2,441,000	$ 2,500,000

REMARKS.

Closed mortgage. $4,492,000 deposited under Unifying Mortgage. Subject to call upon any interest date, at 110 and weeks' notice.

Sinking fund for five years, beginning March 1st, 1904	$150,000	per an
1909 to 1913	200,000	"
1914 to 1918	250,000	"
1919 to 1923	300,000	"
1924 to 1928	350,000	"
1929 to 1933	400,000	"

These payments to be applied, initially, to the redemption of bonds for sinking funds of Bay Counties Power Company, Gas and Electric Company, Sacramento Electric, Gas and Railway Company and Valley Counties Power Company. The applied to the creation of a sinking fund for this issue. $808,000 of this issue and $50,000, bonds of subsidiary companies ar sinking fund. In addition, $46,000 of subsidiary bonds have been cancelled thereby.

Closed mortgage, except $357,000, reserved to retire numbers 7 and 8.
Annual sinking fund payments, expressed in percentages of total issue outstanding as follows:

1 %	June 1, 1905, to June 1, 1909
1½%	June 1, 1910, to June 1, 1914
2 %	June 1, 1915, to June 1, 1919
2½%	June 1, 1920, to June 1, 1924
3 %	June 1, 1925, to June 1, 1929

This sinking fund now holds $162,327.45 of alive bonds and cash.

Closed Mortgage.

Closed Mortgage.

Closed Mortgage.

Closed Mortgage. Sinking fund payments, expressed in percentage of bonds outstanding:

1 % Nov. 1, 1905, to Oct. 31, 1909	2½% Nov. 1, 1920, to Oct. 31, 1924
1½% Nov. 1, 1910, to Oct. 31, 1914	3 % Nov. 1, 1925, to Oct. 31, 1929
2 % Nov. 1, 1915, to Oct. 31, 1919	This sinking fund now holds $184,330 of alive l

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Co. 5s	6-1-31	F1 & A1	Mercantile Trust Co., San Francisco.	$
Oakland Gas, Lt. & Heat Co. 5's	3-16-16	M16 & S16	Office of Company, San Francisco.	....
Sac. El., Gas & Ry. Co. 5's.	11-1-27	M1 & N1	Mercantile Trust Co., San Francisco. Guaranty Trust Co., New York.	....
Central El. Ry. Co. 6's.....	Serially 1912-22	J1 & D1	Mercantile Trust Co., San Francisco. Union Trust Co., New York.	.....
Berkeley El. Ltg. Co. 6's...	7-1-21	.....	.....	.....
Blue Lakes Water Co. 6's...	3-15-38	M15 & S15	Office of Company, San Francisco.	$
Stockton Water Co. 6's.....	4-1-11	A1 & O1	Ill. Tr. & Sav. Bank, Chicago.	.....
United Gas & El. Co. 5's...	7-1-32	J1 & J1	Mercantile Trust Co., New York. Crocker Natl. Bank, San Francisco.	.....

REMARKS.

Closed Mortgage. Annual sinking fund of 2% of bonds outstanding began August 1, 1902. This sinking f
alive bonds and cash.

Closed Mortgage.

Closed Mortgage, except $265,000 reserved to retire No. 13. Sinking fund provides for Cancellation of:
5 bonds each year.....Nov. 1, 1902, to Nov. 1, 1906
10 bonds each year.....Nov. 1, 1907, to Nov. 1, 1911
20 bonds each year.....Nov. 1, 1912, to Nov. 1, 1916
30 bonds each year.....Nov. 1, 1917, to Nov. 1, 1921
40 bonds each year.....Nov. 1, 1922, to Nov. 1, 1926
Sinking fund now holds $65,072.50, cancelled bonds and cash.

Closed Mortgage.

Closed Mortgage—Entire issue of $26,000 deposited under Unifying Mortgage.

Closed Mortgage.

Closed Mortgage. Funds deposited to pay at maturity, April 1st, 1911. Sinking fund holds $112,216.54, c

Sinking fund, expressed in percentage of bonds outstanding
2% for the first five years, beginning July 1, 1907
3% for the next five years, beginning July 1, 1912
4% for the next five years, beginning July 1, 1917
5% for the next five years, beginning July 1, 1922
6% thereafter.
Sinking fund now holds $47,000 of alive bonds of allied corporations, and $119,000 cancelled bonds of this is

CALIFORNIA GAS AND ELECTRIC CORPORATION ISSUES

	ISSUE.	DUE.	INTEREST WHEN PAYABLE.	INTEREST WHERE PAYABLE.	PAR VALUE OUTSTANDING. IN SINKING FUNDS.	HELD BY PUBLIC.	TOTALS.
18	South Yuba Water Co Cons 6's	7 1 23	J1 & J1	Farmers Loan & Trust Co., New York.	.....	$ 1,500,000	$ 1,500,000
19	Central Cal El Co 5's	5 1 53	M1 & N1	Madison Trust Co., New York.	.....	$ 40,000	$ 40,000
20	Standard El Co 5's	9 1 29	S1 & M1	Mercantile Trust Co., New York. Crocker Natl. Bank, San Francisco.	$ 47,000	$ 2,488,000	$ 2,535,000
	Total California Gas and Electric Corporation Issues				$ 1,353,000	$35,507,000	$36,860,000

REMARKS.

Closed Mortgage—Callable at 110 and Interest.

Closed Mortgage—$810,000 deposited under Unifying Mortgage.

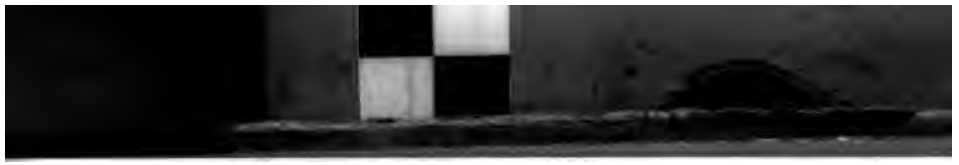
Closed Mortgage—$2,465,000 deposited under Unifying Mortgage.

SAN FRANCISCO GAS AND ELECTRIC COMPANY ISSUES

	ISSUE	DUE	INTEREST DATES	WHERE PAYABLE	PAR VALUE OUTSTANDING. IN SINKING FUNDS	HELD BY PUBLIC.	TOTALS.
21	San Francisco Gas & Elec. Co. 4½s	[illegible]	M & S 15	Union Trust Co., San Francisco	$ 133,000	$ 7,313,000	$ 7,446,000
22	Pacific Gas Imp. Co. 4s	9 1 [illegible]	[illegible]	Union Trust Co., San Francisco.	.....	$ 1,027,000	$ 1,027,000
23	Folsom Light & Ry. Co. 6s	11 1 21	F 1 & Au 1 Au 1 & F 1	Office of Company, San Francisco	.....	$ 623,000	$ 623,000
24	Mutual El. Lt. Co. 1st 5s	6 1 54	J 1 & D 1	Mercantile Trust Co., San Francisco. U. S. Mtg. & Tr. Co., New York.	.....	$ 237,000	$ 237,000
	Total San Francisco Gas and Electric Company Issues				$ 133,000	$ 9,200,000	$ 9,333,000

SUMMARY OF BONDS

ISSUES.	
Pacific Gas and Electric Company	
California Gas and Electric Corporation	
San Francisco Gas and Electric Company	
Totals	



REMARKS.

In hands of public.....
In sinking funds of allied companies.....
In Company's Treasury .....
Reserved to retire underlying bonds (Nos. 22 and 23).....
Cancelled by sinking funds.....

Total authorized issue .....

Annual sinking fund of $105,000, beginning November 1, 1906, to be used only in retiring bonds 105 and accrued interest. Bonds for sinking fund drawn by lot by Board of Directors on or before Sep

These Bonds are secured by first mortgage lien upon all of the properties of the San Francisco Ga hereafter acquired, subject only, upon a portion of the property, to the issues at 22 and 23, for the retir issue have been reserved.

Closed Mortgage—Sinking Fund $20,000 annually. $152,000 bonds cancelled to date.

Closed Mortgage.

Closed Mortgage—Sinking Fund 2½% per annum of bonds issued and outstanding. $13,000 bonds

IN HANDS OF PUBLIC

IN SINKING FUNDS	HELD BY PUBLIC.	TOTALS.
	$12,701,975	$12,701,975
$ 1,353,000	35,507,000	36,860,000
133,000	9,200,000	9,333,000
$ 1,486,000	$57,408,975	$58,894,975

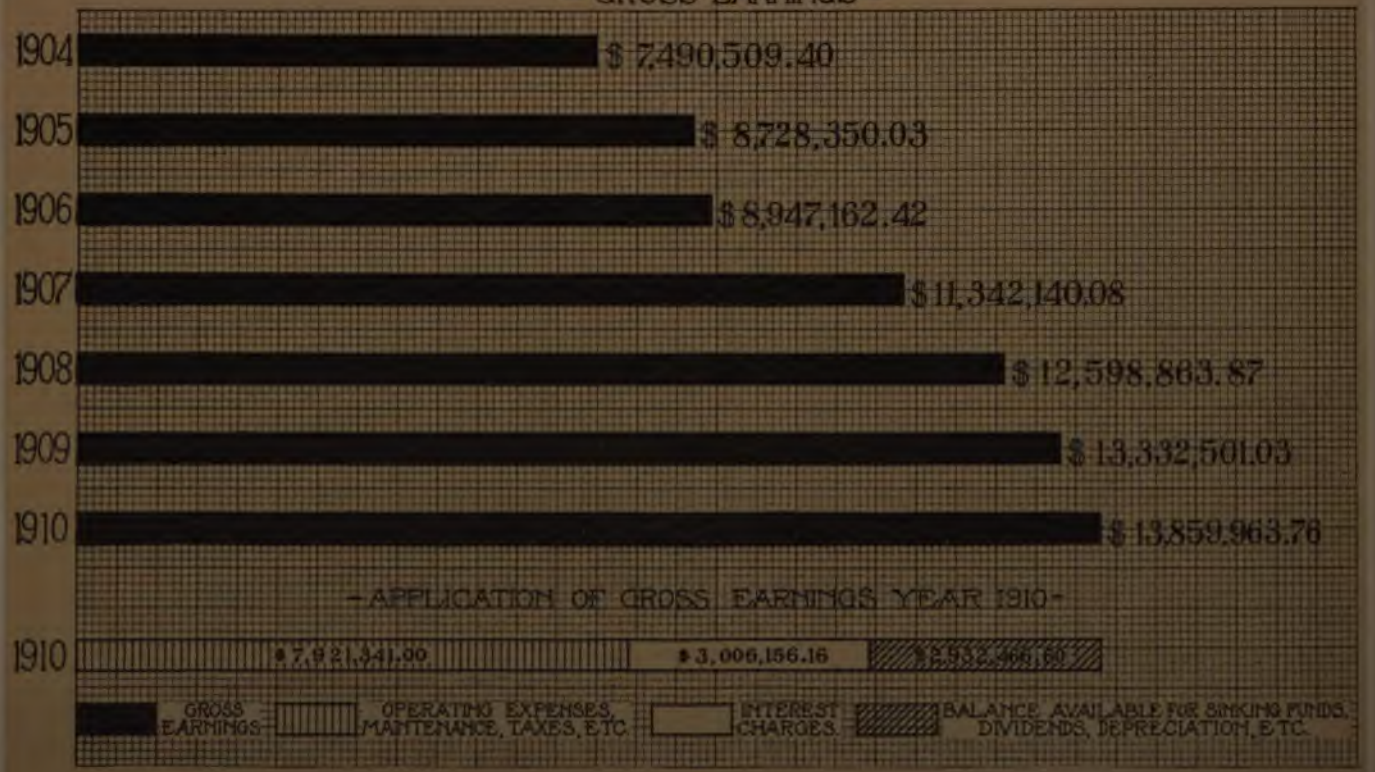
Second Vice-Pre

PACIFIC GAS AND ELECTRIC COMPANY (ALL COMPANIES)

SEVEN YEARS PROGRESS GRAPHICALLY SHOWN

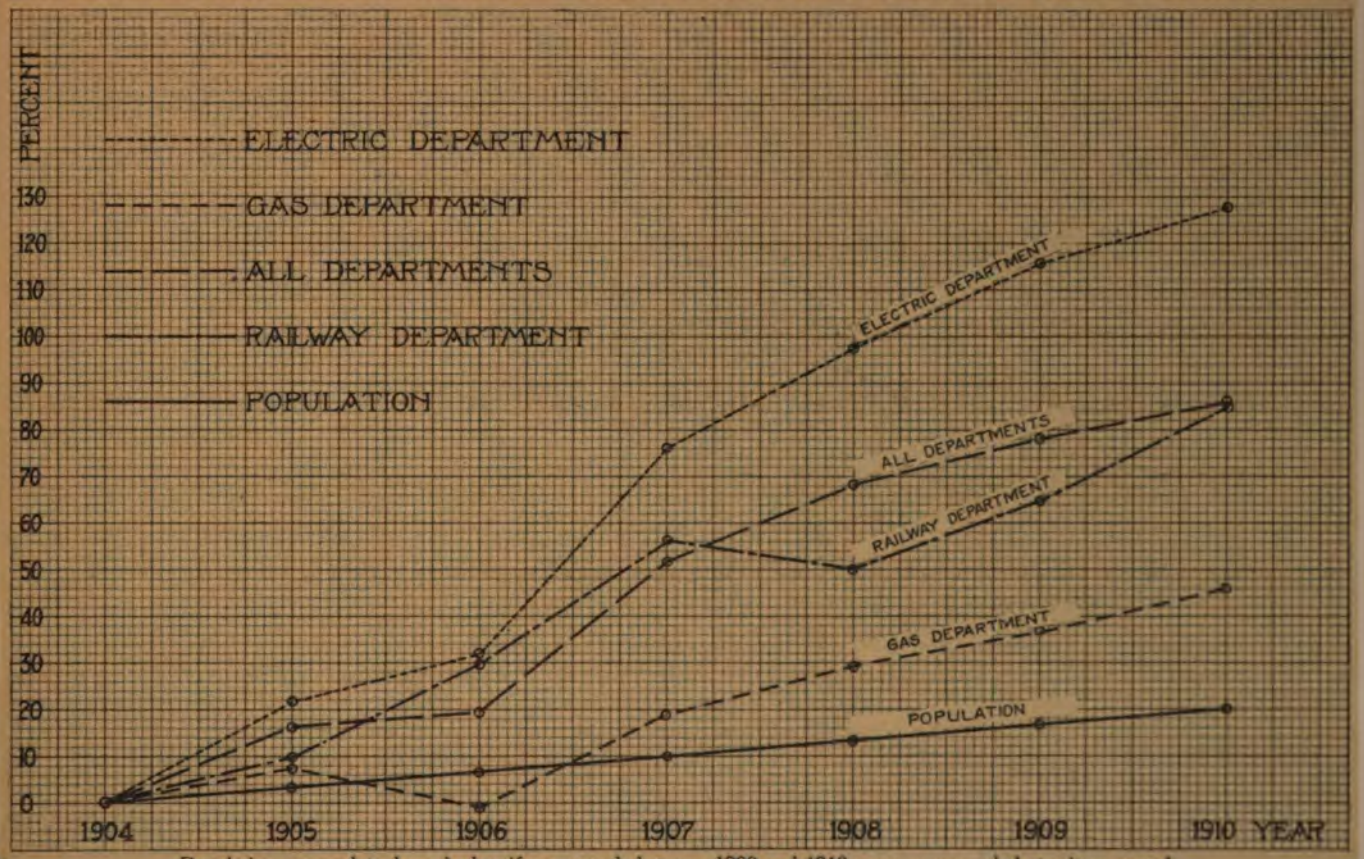
ALL INTER-COMPANY TRANSACTIONS AND EARNINGS IN SUSPENSE, ELIMINATED

– GROSS EARNINGS –



PACIFIC GAS AND ELECTRIC COMPANY (ALL COMPANIES)

GRAPHICAL CHART SHOWING THE YEARLY INCREASES OF EARNINGS AND POPULATION BY PERCENTAGES.



Population assumed to have had uniform growth between 1900 and 1910 censuses over whole territory served.

HISTORICAL AND STATISTICA

History of Hydro-Electric and Gas Development in Central California

TO TELL fully of the development of the Electric and Gas industries of the central part of the State of California would mean to write the history of the growth of the State in population, manufacture, agriculture and all their allied branches for the past fifteen years. In the year 1891, there had been installed a hydro-electric plant on the European continent, rather in the nature of an experiment, but subsequently proving practical, and known as the Frankfort-Lauffen transmission of 81 miles, and was an actual forerunner of the developments subsequently to be made not only on the continent of Europe, but in America. In the year 1892, the San Antonio Light & Power Company built and operated what was known as the Pomona plant, in Southern California, with a transmission of 30 miles, operating under 10,000 volts. The first polyphase plant to be built in California was that from Mill Creek to Redlands, in 1893, and operating under 2,500 volts.

On Admission Day, September 9, 1895, the "Folsom Water Power Company" completed its transmission line of 11,000 volts, from Folsom to Sacramento, and a start was then made in hydro-electric work, that was in a few short years to exceed the most sanguine expectation of its promoters. This installation, which totaled 3,352 horse-power, was generated at 800 volts, transformed to 11,000 volts and sent over 22 miles of copper wire to supply the city of Sacramento with electric energy for its street railway system, and for lighting and incidental power.

While these then so-called gigantic works were in process of construction, water rights on the northern rivers in California had been taken up by intrepid pioneers, with the thought that at some distant day the hope of the utilization of water other than for past purposes of mining and irrigation might be realized. Among these pioneers was Mr. A. A. Tredgido, who, in the winter of 1891-2, located a water right on the South Yuba River in Nevada County. He later enlisted the services of Mr. Eugene J. de Sabla, Jr., of San Francisco, through whose efforts, coupled with the energetic association of Mr. John Martin, was made possible the commencement of a plant, in July, 1895, on the South Yuba River, in Nevada County, known as the Rome Power House, for the purpose of supplying Nevada City, Grass Valley and the adjacent mines with light and power, and in February, 1896, the system was completed and put into operation.

This was the beginning of the California Gas and Electric Corporation, which was incorporated December 4, 1901, and consists of the following companies:

POWER DIVISIONS.	DATE OF INCORPORATION.
Bay Counties Power Co.	June 1, 1900.
Valley Counties Power Co.	Jan. 24, 1902.
Standard Electric Co. of California.	Feb. 6, 1895.
Yuba Electric Co.	Jan. 30, 1899.
Nevada County Electric Power Co.	Sept. 22, 1892.
Butte County Electric Power & Light Co.	April 12, 1899.
Central California Electric Co.	June 6, 1895.
WATER DIVISIONS.	
Blue Lakes Water Co.	April 17, 1890.
South Yuba Water Co.	April 1, 1880.
Stockton Water Co.	Oct. 20, 1880.
DISTRIBUTING DIVISIONS.	
Oakland Gas, Light & Heat Co.	June 28, 1884.
Sacramento Electric, Gas & Railway Co.	April 1, 1896.
United Gas & Electric Co.	April 19, 1902.
Berkeley Electric Lighting Co.	June 4, 1894.
Fresno Gas & Electric Light Co.	Dec. 14, 1888.
Vallejo Gas Co.	Oct. 28, 1904.
Chico Gas & Electric Co.	Jan. 30, 1901.
Colusa Gas & Electric Co.	July 29, 1901.
Marysville Gas & Electric Co.	May 12, 1895.
Napa Gas & Electric Co.	July 29, 1899.
Nevada County Gas & Electric Co.	May 25, 1901.
Petaluma Gas & Electric Co.	April 12, 1899.
San Rafael Gas & Electric Light Co.	Mar. 30, 1887.
Santa Rosa Lighting Co.	Sept. 15, 1888.
Woodland Gas & Electric Co.	Jan. 15, 1901.

On October 11, 1905, the Pacific Gas and Electric Company was organized, and on December 31, 1905, the control of the San Francisco Gas and Electric Company obtained.

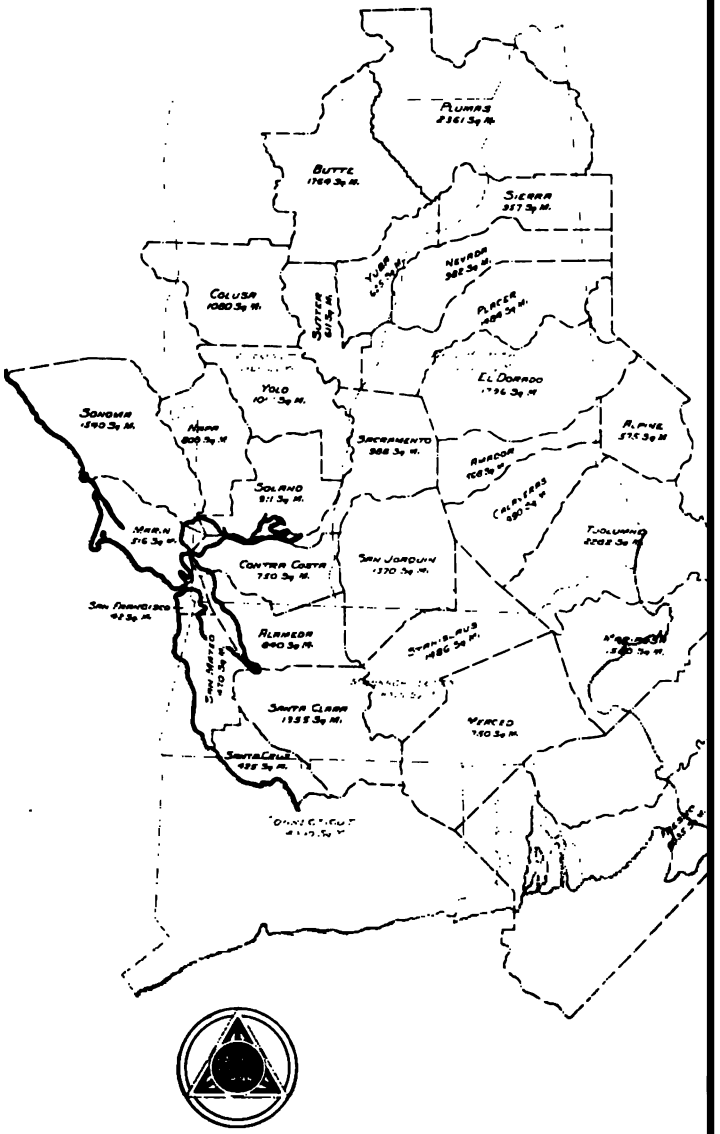
Since January 1, 1906, the properties above enumerated of the California Gas and Electric Corporation have been operated by the Pacific Gas and Electric Company.

The Pacific Gas and Electric Company owns property and operates in the following counties of California:

Alameda,	Plumas,
Amador,	Sierra,
Alpine,	Sutter,
Butte,	Sonoma,
Colusa,	Sacramento,
Calaveras,	San Francisco,
Contra Costa,	San Joaquin,
El Dorado,	Solano,
Fresno,	San Mateo,
Marin,	Santa Clara,
Mariposa,	Santa Cruz,
Merced,	Stanislaus,
Napa,	Tuolumne,
Nevada,	Yolo,
Placer,	Yuba;

representing an area of 37,950 square miles, greater in extent than the combined area of the States of New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut. See superimposed map of comparative areas.

It supplies in these counties 204 cities, towns and villages, representing in population, two-thirds of the entire population of the State.



The physical characteristics of the several plants, as of January 1, 1911, both Gas and Electric, may be summarized as follows:

HYDRO-ELECTRIC PLANTS

PLANT.	K. W. INSTALLED.	H. P. EQUIVALENT.
1. De Sabla	13,000	17,427
2. Centerville	6,400	8,575
3. Electra	20,000	26,810
4. Colgate	14,920	20,000
5. Yuba	660	885
6. Nevada	1,260	1,689
7. Folsom	3,750	5,028
8. Alta	3,000	4,022
9. Auburn	500	670
10. Newcastle	800	1,073
11. Deer Creek	5,500	7,372
Total	69,790	93,551

STEAM PLANTS

PLANT	K. W. INSTALLED.	H. P. EQUIVALENT.
1. Station A, San Francisco	28,500	38,200
2. Station C, Oakland	9,000	12,066
3. Station A, San Jose	2,300	3,083
To be installed in 1911	32,000	42,880
Total Steam	71,800	96,229
Total Hydro-Electric	69,790	93,551
Total on System	141,590	189,780

WATER STORAGE

For Power	1,173,768,000 cu. ft.
For Irrigation	2,362,646,550 " "
Total	3,536,414,550 cu. ft.

or 1,637,239 miner's inches for twenty-four hours, or 26,453,380,460 gallons—a capacity sufficient to supply the city of San Francisco for over two years, on the basis of a daily use of 35 million gallons.

DITCHES AND FLUMES

For Power	174.0 miles
For Irrigation	381.4 "
Total	555.4 "

PIPE LINES

For Power, 25 in all, having a total length of 65,721 feet.

WATER WHEELS

For Power, 45 in all, having a total capacity of 117,150 H. P.

GENERATORS

Impulse Wheel Driven	30	Capacity,	77,132 H. P.
Hydro-Turbine Driven	8	"	16,420 "
Steam Turbo and Reciprocating	13	"	53,349 "
Total	51	"	146,901 "

SUB-STATIONS ON TRANSMISSION LINES

Number ..... 178 Capacity in Transformers .... 206,025 H. P.

TRUNK POWER LINES

Operating at 60,000 volts ..... 1,096 miles

DISTRIBUTING LINES

In all territories, operating under 60,000 volts ..... 1,794 miles

STREET LIGHTS IN CITIES AND TOWNS

Arcs and Incandescents	16,261
Gas (Welsbach)	5,499

CONSUMERS OF RECORD

Electric	82,721
Gas	152,403
Water, Domestic	5,110
Water, Irrigating	700
Total	240,934

OUTPUT OF POWER PLANTS FOR 1910

Hydro-Electric	255,861,874	K. W. H.
Steam	28,796,407	"
S. F.	82,209,055	"
Total	366,867,336	"

GAS PLANTS

Capacity in Daily Output 1911	35,800,000 cu. ft.
Output during year 1910	5,437,350,400 "
Services laid December 31, 1910	153,519
Mains laid December 31, 1910, miles	1,634.21

WATER PLANTS

Pumped from wells for domestic purposes in 1910	1,166,756,029 gallons.
Supplied from storage for irrigation in 1910	17,672,595,820 "
Feet mains laid for domestic use in 1910	269,714

STREET RAILWAY SYSTEM
SACRAMENTO—YEAR 1910.

Number miles single track	35.86
Average number of cars operated daily	43
Average number employees	188
Passengers carried	10,691,475
Passengers per car mile	5
Earnings per car mile	23.3 cents
Car mileage	2,136,494

The foregoing, showing the magnitude of the present operations of the Company, may well be followed by a brief history of the several plants, making up the present organization.

The several companies will be mentioned in the order of their original creation.

FOLSOM SYSTEM

The Folsom Power Houses contain five generators of an aggregate capacity of 5,028 horse on the American River, at the town of Folsom, and take water from the American River; the ge under a low head of 55 feet at the upper power house, and 26 feet at the lower. The original inst horse-power generators, which has since been increased to five. The voltage was 800, three phas 11,000 volts, which has since been increased to 60,000. The transmission line is approximately 22 Sacramento sub-station and transformers of a total capacity of 3,000 horse-power, serve a portion of the balance being obtainable from transmission lines connected to all other power plants.

NEVADA SYSTEM

The inception of the Nevada plant on the South Yuba dates back to 1891, when an effort v County Electric Power Company to put a diverting dam across the river, but in the spring of 1892 was swept away by the fury of the flood waters. Another dam was started August completed November 20th. This dam was of logs piled crib fashion and it was bolted firmly down to bedrock in the river. It was twenty-eight feet high and measured one hundred and seven feet across the crest from bank to bank at that point of the canyon. Work on the flume from this dam was started July 6th, and completed November 28th. The flume itself was six feet wide and four and a half feet deep, and its construction took a force of 110 men working nearly four months and using 1,250,000 feet of lumber. The power house was first operated in February, 1896. March 1, 1898, as an addition to the water supply, a crib dam fifty-four feet high and 327 feet across the crest from bank to bank, was started in Rock Creek to back wat up into a partially excavated basin that had formerly been the scene of hydrau diggings. It was completed November 27th and named "Lake Vera." For the original installation watt, 133-cycle, two-phase, Stanley inductor type generators, and generating at 5,500 volts. Each three-foot Pelton impulse wheels. When, in 1900, more power was demanded, arrangements were ma gate (now also the property of the Pacific Gas and Electric Company) by which a 23,000-volt curr ridges to Grass Valley, where four 200-kilowatt transformers were installed to lower the voltage from 2 it could be combined with the initial power from the Nevada plant.

STANDARD SYSTEM

Following the completion of the Folsom plant, the "Blue Lakes Water Company", in 1896, commenced the installation of a hydro-electric plant in connection with its water system, then supplying water for power to mines on the mother lode, and in 1897 installed on the Mokelumne River, just above the main bridge crossing said river, between Mokelumne Hill and Jackson, a plant consisting of three 600 horse-power generators, operating under 1,040-foot head. Two transmission lines, both operated at 18,000 volts, supplied the southern mines in Amador County and an extension of the mother lode in Calaveras County, while an additional transmission line, at 30,000 volts, supplied energy to the Stockton Gas & Electric Company, in the city of Stockton, for light and power. The promoters, realizing the large demand which would follow the installation of an electric transmission line towards bay points, determined upon the enlargement of the original Blue Lakes plant, so-called and incorporated what was then known as "The Standard Electric Company of California", and commenced the erection of an entirely new plant, at a point on the river about four miles north of the original installation, known as the Electra Power House. On November 1, 1899, prior to the completion of the new installation, the old plant was destroyed by fire.

It was, however, rehabilitated and operated during the construction of the new plant, and upon the completion of the Electra installation in 1902, the old plant was abandoned. The first installation in the new plant was five 2,666 horse-power generators, under a head of 1,466 or 1,266 feet, as desired, feeding directly on the high head from the Standard Canal, through its penstock, the "Petty Reservoir", or, on the low head from "Lake Tabeaud", into which the Standard and Amador Canals both empty. A tunnel from "Tabeaud" and wooden stave pipe from "Petty" lead to the manifold where change from high to low head is made.

The main storage reservoirs of the "Blue Lakes Water Company", supplying the power house above mentioned, are what are known as the "Blue Lakes", "Twin Lakes" and "Meadow Lake" in Alpine County, and "Bear River Reservoir" in Amador County. These have an aggregate capacity of 1,079,902,616 cubic feet, and are called upon only after the Mokelumne River, on which the head dams are situated, falls below the requirements of the power house. The water from these lakes flows through a natural watercourse to the head dams where the Standard and Amador Canals, 42½ miles distant from the Lakes, convey it by ditches and flumes to "Lake Tabeaud."

When the property of the Standard and Blue Lakes Companies were acquired by the corporation, the Electra power house was extended and two additional units of 6,666 horse-power capacity installed, together with an additional pipe line connected to both high and low head.

PHYSICAL DATA, ELECTRA POWER PLANT

Capacity of Storage Reservoirs ..... 1,079,902,616 cubic ft.
Area of Storage Reservoirs ..... 949.3 acres.

LAKE.	ELEVATION, FEET.	FLOODED AREA, ACRES.	DEPTH, FEET.	CAPACITY, CUBIC FEET.
Twin	8,172	118.3	20	62,063,850
Upper Blue	8,131	343.5	27.5	293,859,766
Lower Blue	8,040	145	35	162,000,000
Meadow	7,773.5	141.2	65.5	244,500,000
Bear River	5,680	161.6	57.5	267,054,000
Tabeaud	1,965	39.7	90	50,425,000
Totals		949.3		1,079,902,616

Length of main ditch and flume system		36.75 miles
Flow per second in main ditch system		243 cubic feet
Elevation head	two pipes, each	1,466 feet
	1 pipe	1,266 feet
Pressure of water per square inch	two pipes, each	636 pounds
	1 pipe	548 pounds
Speed of jets down at the power house		3.4 miles a minute.
Number of impulse wheels		8
Total electrical horse-power		26,810
Generating voltage		2,300
Voltage on main line		60,000
Altitude of Petty, or forebay, reservoir		2,160 ft.
Altitude at power house		693 ft.
Size of power house		40x270 ft.

Material of building—Concrete foundations, steel frame, galvanized iron covering.
Plant placed in service, 1902.

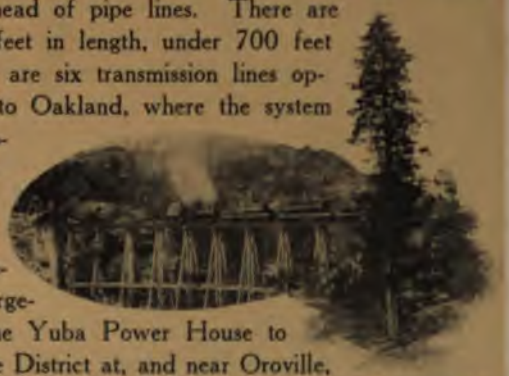
It is interesting to note that in the development of the larger units, both in generators and water wheels, the 13,333 horse-power last installed at Electra occupy a floor space of a little less than one-half of that required for the previous installation of the same capacity.

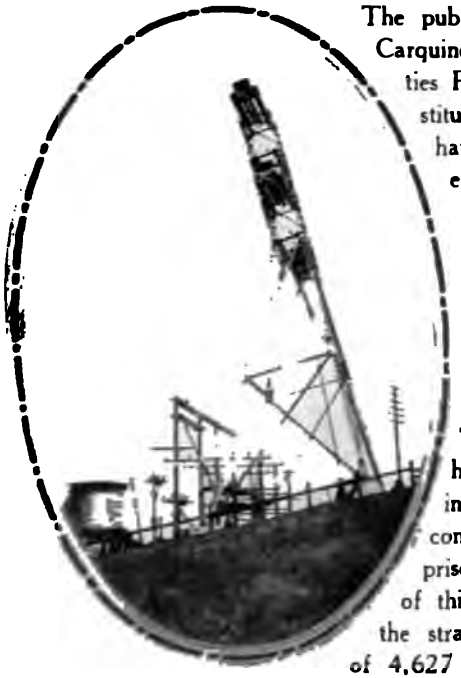
COLGATE SYSTEM

The practical inception and birth of the direct corporation work was in the development of the waters of the South Fork of the Yuba River, and the completion of what was known as the Rome Power House, in February, 1896, for supplying current to the cities of Nevada and Grass Valley for power and lighting purposes. In the development of this branch of the South Yuba, the attention of the promoters was directed to the possibilities of development on the Middle Fork of the Yuba River where a dam had been built, and water carried by flumes and ditches into what is known as Brown's Valley, for irrigation purposes, and there was erected in April, 1898, at the head of Brown's Valley, by what was then known as the "Yuba Power Company," a plant having a capacity of 1,220 horse-power, operated by a pipe line 850 feet in length and under 292 feet head, feeding a power line at 16,500 volts, and supplying, primarily, the town of Marysville; this line being approximately 23 miles in length. This was a record-breaking installation, as the entire work was finished and the plant in operation within four months and five days after its building had been determined upon. Immediately thereafter, and at a point on the river known as Missouri Bar, the "Colgate" power house of the "Bay Counties Power Company" was commenced, under contract to deliver power into Sacramento, a distance of 76.3 miles. This Herculean task was accomplished and the first installation, in 1899, consisted of three 1,200 horse-power generators, operating under 40,000 volts. A transmission line, 76.3 miles in length, was built to the city of Sacramento, at that time the longest transmission in the world, and on September 5, 1899, current was supplied to the system of the Sacramento Electric, Gas & Railway Company, and operated in parallel with the steam plant in Sacramento and the hydro-electric plant at Folsom. In addition thereto, a line was operated from Colgate to dredges on the Feather River, at Oroville, and one to the Rome Power House on the South Yuba River, and for the latter purpose there was installed in the Colgate Power House one generator of 960 horse-power, operating at 133 cycles, that being the periodicity of service at the Rome Power House, and subsequently the 40,000-volt line at 60 cycles was extended and operated in that same district.

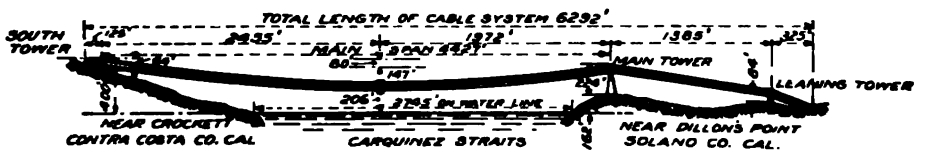
The capacity within the next two years of the Colgate plant was increased by an additional building and the installation of three 2666 horse-power generators, and at a later date one 6333 horse-power was installed, the present capacity being 20,000 horse-power.

Colgate obtains its supply of water through a flume which was built immediately over the then existing Irrigation District flume. It has a capacity of 15,000 miner's inches and is 7.6 miles in length. As a safeguard, additional water for the Colgate plant is stored in an artificial lake, known as "Lake Frances," at the head of Dobbins Creek, just above the power house. This lake has a capacity of 110,000,000 cubic feet, and by means of a rapid flume, 8,500 feet in length, under 300 feet head, feeds into the penstock at the head of pipe lines. There are five pipe lines operated from the penstock to the power house, each 1,625 feet in length, under 700 feet vertical head, pipe being of steel and cast iron, 30 inches in diameter. There are six transmission lines operated from Colgate, two operating to Oakland, where the system is tied in with the Standard, one operating from Colgate direct to Sacramento, one operating to and taking care of the dredge load on the Yuba River, near Marysville, this being in fact a continuation and enlargement of the original line from the Yuba Power House to Marysville; one to the Dredge District at, and near Oroville, on the Feather River, tying in at that point with De Sabla, and one of 60 cycles to Grass Valley Sub-station. April 27, 1901, will always be regarded as a red letter day in the history of the corporation, for on that day the consummation of the most sanguine expectations of the promoters of the enterprise was achieved. The "Bay Counties Power Company," from its Colgate plant, transmitted electric power by twin lines, to the city of Oakland, in Alameda County, over mountain, hill, valley, river and forest, a distance of 140 miles; and at a signal from the engineers, the switch was closed, and power from the eternal snows was transmitted to motor generator sets, supplying current for the street railway systems in Oakland.





The public will without doubt regard the great span of wire across the Straits of Carquinez, as being the most spectacular feature of the entire system of the "Bay Counties Power Company," and indeed the building of this enormous span has truly constituted a wonderful achievement. Although cables for telephone and telegraph service have been laid under the straits for many years, it was by no means possible to lay electric power cables there, for many most valid commercial and technical reasons. The rivers of the great valleys of Central California—even its entire portion between the Siskiyous and the Tehachapi—find their way to the ocean through the Straits of Carquinez, where the tide runs deep and swift, and where the cables are subjected to wear that would soon bring destruction, to any that might carry electric power service at very high pressure. To carry the lines overhead, therefore, was the only alternative, and the fact that there was no engineering precedent for the work, proved to be no detriment, for in truth it can be said that the system of the "Bay Counties Power Company", from its inception to its completion, was one that had been executed without relying upon precedent. Nor is it believed, that anywhere in the world, but in the West can there be found the rare combination of courage of conviction, united with the daring yet prudent capital, so necessary to prove an enterprise to be independent as to precedents and resourceful as to expedients. The bay lines of this company operate at times the entire load of the system, over the cables crossing the straits that are in excess of a mile in length, and which cover the horizontal distance of 4,627 feet in a single span that has a clearance of 206 feet above extreme high tide.



DE SABLA SYSTEM

After the installation of the Colgate system, the increased demand for power, made the possibilities of the development of power upon Butte Creek, in Butte County, attractive to the pioneers of the "Bay Counties Power Company." A small plant had been operated for some time by the "Butte County Electric Light & Power Company," at or near John Adams Post Office, commonly known as the Centerville Power House.

The "Valley Counties Power Company" was incorporated in 1902, financed, purchased the plant at Centerville, and proceeded with the erection of what is commonly known as the "De Sabla Power House," on Butte Creek, utilizing the waters of the west branch of the Feather River, and that of Butte Creek, through Butte, Toadtown, Hendricks, Inskip, and Miners ditches.

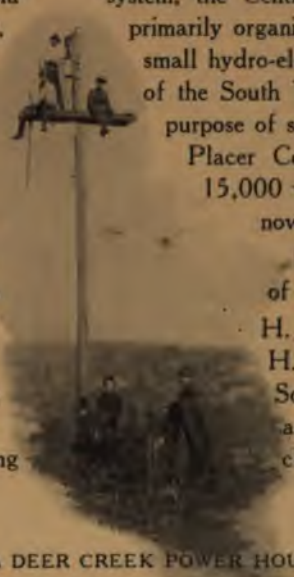
From the De Sabla plant, and in connection with the Centerville plant, a high tension line is operated through Butte and Yuba Counties, connecting with the transmission line from the Colgate Power House at Oroville, another branch operating to Chico and Colusa; thence, on through Gridley to Marysville and Nicolaus, where it is again tied into the Bay Counties twin line.

PHYSICAL DATA. DE SABLA PLANT.

Capacity of main storage reservoir	38,000,000 cu. ft.
Area of main storage reservoir	90 acres
Miles of main ditch and flume system	54.38
Miles of subordinate ditches and flumes	20
Flow the second in main ditch system	180 cu. ft.
Pressure head (height of fall)	1,531 ft.
Force of water the square inch	664 lbs.
Number of impulse wheels	4
Number of turbines	0
Total electrical horse-power	17,427
Generating voltage	2,400
Voltage on power lines	60,000
Altitude of reservoir	2,600 ft.
Altitude at power house	1,000 ft.
Size of power house	50x109 ft.
Material of building—Concrete foundation, steel frame, galvanized iron covering. Concrete walls, galvanized iron roof on steel frame.	
Plant placed in service	Oct. 22, 1903

CENTRAL CALIFORNIA SYSTEM

Coincident with the construction of the De Sabla system, the Central California Electric Company, a subsidiary company of the South Yuba Water Company, primarily organized and operated for the purpose of supplying water for power or mining purposes, built two small hydro-electric plants at Auburn and Newcastle, in Placer County, along the lower lines of the ditches of the South Yuba Water Company, their construction having been commenced in the year 1895, for the purpose of supplying power to the city of Sacramento. In 1900, a power house was built at Alta, also in Placer County. The first transmission line from Auburn and Newcastle to Sacramento was operated at 15,000 volts, and upon the completion of the Alta plant this potential was increased to 30,000, and is now operated at 60,000 volts.



The original installation at Alta comprised three 1,333 H. P. generators, operated by the Girard type of turbine, under a head of 660 feet, length of pipe line 5,380 feet.

At Auburn, the installation consisted of a 670 H. P. generator, driven by an impulse wheel under a head of 206 feet, and at Newcastle two 536 H. P. generators, driven by impulse wheels, under a head of 464 feet. The irrigation system of the South Yuba Water Company afforded on Deer Creek, in Nevada County, an opportunity to take advantage of a natural fall of 837 feet, and in 1908 a plant was completed having the following characteristics:

PHYSICAL DATA DEER CREEK POWER HOUSE

Capacity of storage reservoirs...	1,975,568,000 cu. ft.	Generating voltage.....	2,300
Area of storage reservoirs.....	2,160 acres.	Voltage on power lines....	60,000
Miles of ditch and flume.....	19.5	Altitude at forebay reservoir.	4,496 ft.
Flow the second in ditch.....	100 cu. ft.	Altitude at power house...	3,659 ft.
Pressure head (height of fall)..	837 ft.	Size of power house.....	41x53 ft.
Force of water the square inch..	360 lbs.	Material of building—Concrete walls, galvanized iron roof, steel frame	
Number of impulse wheels.....	2		
Capacity of generator in kilowatts,	5,500		
Total electrical horse-power....	7,372	Plant placed in service	May 6, 1908

CALIFORNIA CENTRAL SYSTEM

Mr. John Martin, one of the original pioneers of water power development, determined that for economical distribution of both gas and electricity throughout the territory then controlled by the "Bay Counties Power Company", it would be advisable to purchase the several smaller gas and electric companies operating along said lines. He therefore organized, on March 23, 1901, the "California Central Gas and Electric Company", and purchased the operating companies in the cities of Nevada City, Grass Valley, Marysville, Woodland, Chico, Colusa, Napa, Petaluma, Santa Rosa and San Rafael, all of which were subsequently merged with the corporation. These companies formed the nucleus of the large distributing systems, now owned and controlled, and were in a measure responsible for the rapid growth of the corporation, affording as they did, a large and profitable outlet for the generating power.

OTHER DISTRIBUTING SYSTEMS

The gas plant at Fresno was purchased in 1903, and the entire plant, both gas and electric, and the street railway system of the Sacramento Electric, Gas & Railway Company in 1904. Upon the formation of the corporation, the Oakland Gas, Light & Heat Company, with its subsidiary companies—the Berkeley Electric Light Company and the Alameda Gas Company—were purchased, and subsequently in 1905 the Vallejo Gas Company became a part of the corporation.

When the corporation purchased the Standard Electric Company of California, the properties of the United Gas & Electric Company, operating all of the cities and towns on the San Francisco peninsula, between San Jose and the corporate limits of the City and County of San Francisco, were also acquired.

All of the cities and towns mentioned, with the exception of Fresno (which distributes gas only), are connected with the transmission lines of the corporation, the entire system of power houses located at Electra, Folsom, Auburn, Rome, Alta, Deer Creek, Newcastle, Colgate, Yuba, De Sabla and Centerville, being operated in parallel, and feeding the power required into its system.

With the growth of the power companies, grew also in proportion the development of industries along the line of the corporation; from a small beginning of 880 horse-power, developed by water at the Rome Power House, has sprung into existence a system operating to-day over 145,000 horse-power.

The steam plants in Oakland, San Francisco and San Jose operate in parallel with the entire system whenever required.

SOUTH YUBA SYSTEM

The South Yuba system contains the immense wate
Lake Spaulding, Van Norden Lake, and ten otl
having an aggregate capacity of 2,257,900,000 c
power, irrigation and domestic uses, through 381.4 m
Nevada and Placer Counties. A part of this water is t
House at Auburn, at Newcastle, and at Deer Creek. From these power houses there are eig
77 miles, and serving by a separate line, Sacramento, and also feeding into the general system o

Apart from this power service, the counties of Nevada and Placer, with a populati
of 2,466 square miles, are dependent on this system for water for domestic, irrigation and mi
the following lakes:

LAKES.	ACRES.	CA (CU
Blue Lake	63	4
Bear Valley (reservoir)	60	1
Culbertson Lake	67	3
Feeley Lakes	67	3
Fuller Lake	67.5	4
Lake Fordyce	510	87
Lake Spaulding	215.5	25
Lake Sterling	104	7
Lake Valley Lakes	260	23
Lake Van Norden	390	23
Lindsey Lakes	49.3	1
Meadow Lake	249	20
Rock Lakes	23.9	1
Rucker Lake	63	2
White Rock Lake	90	18
Totals	2,279.2	2,25

CANAL.	DITCH FLOW EACH SECOND. CUBIC FEET.	MINER'
Main South Yuba	200	8,
Boardman	75	3.

It is estimated that more than 15,000 acres of land, growing deciduous and other frui
the demand for water constantly increasing, it is contemplated to increase the above storage du

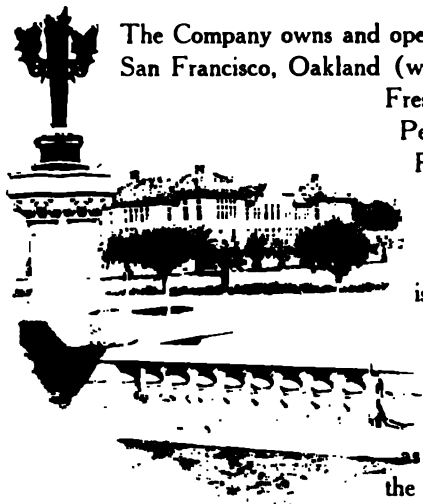
STREET RAILWAY DIVISION

In addition to the hydro-electric power plants and distributing systems, and both gas and electric plants owned by the corporation, it possesses also the street railway system of Sacramento, conceded by street railway engineers as being the most perfectly equipped system in the United States. It operates 35.86 miles of single track and has 43 cars in daily use, being all double-truck cars, of most modern design and construction, and built by the Sacramento Company in its own shops. It employs 188 conductors and motormen, besides the necessary car-house operatives. It carried, during the month of January, 1911, 902,506 passengers, or 4.76 passengers per car mile. In connection with the street railway system is a pleasure park, located without the city limits, under high cultivation, and containing within the enclosure, a modern theatre and the usual concessions which go to make up a park of that kind. The park is free to every one, and a nominal admission fee is charged to each of the concessions.

SAWMILLS AND TIMBER LANDS

In Nevada and Amador Counties, the Company owns 3,580 acres of timber land, and operates two fully equipped sawmills, cutting sufficient lumber to take care of necessary repairs to flumes in the Nevada and Standard Divisions.

GAS DEPARTMENT



The Company owns and operates gas works in the following cities and towns:—
San Francisco, Oakland (which supplies Alameda, Berkeley, San Leandro and Hayward), Fresno, Grass Valley (which supplies Nevada City), Marysville, Napa, Petaluma (supplied by high pressure from Santa Rosa), San Jose, San Rafael (which also supplies San Anselmo and Ross Valley under Vallejo and Woodland. The peninsula south of San Francisco, including San Mateo, Belmont and Redwood City, is supplied with gas pressure main from the Potrero Gas Works in San Francisco; the city is supplied through a high pressure pipe line from Redwood City. As gas properties were acquired coal gas was made from Australian, or Coast coals, or by the water gas process, using anthracite coal imported. The crude oil water gas process, using petroleum exclusively as manufacturing gas, was adopted by this Company soon after its invention as it did, with the rapid development of large petroleum deposits in California the Company to at once make use of a home product for gas making, and consumers of gas with illuminating gas of a quality unsurpassed in the world, in both candle power and heating.

This Company undertook the development of the manufacture of gas from crude oil and has instituted valuable improvements, which places it today in possession of a process for making gas which utilizes every oil, there being no waste; the sole product of the gas works is gas. The improvement in the quality of the service to the consumers naturally increased the output of the various cities and towns, and to meet became necessary to design and install large generating units. This led to the construction of what is known Jones Gas Generating Set, the invention of E. C. Jones, Chief Gas Engineer, having a rated capacity of 3 ft. in twenty hours. The elasticity of this method of making gas is so great, however, that these sets will when called upon to make 4,000,000 cubic ft. of gas a day, and during the peak hours of the winter's at the rate of 5,000,000 cubic ft. per day for a period of three hours.

In San Francisco there are four 16′ oil gas sets, producing the gas used in the City of San Francisco and the cities of the peninsula as far south as Palo Alto. The material used for making the gas, is the crude petroleum of California. This produces a gas over 19 candle-power, having over 650 British Thermal Units to the thousand feet. In making gas from oil there is a by-product remaining known as lampblack. This consists of nearly pure carbon and is recovered from the oil gas generators in what is known as the wash box. In the early days of oil gas making, the lampblack was used as a boiler fuel and in the smaller plants there was enough lampblack recovered for this purpose; but in the larger plants more than enough lampblack was made to provide all the needed fuel and it became a problem to dispose of the surplus. This led to improvements in oil gas making, resulting in the reduction in the amount of oil used to make a thousand feet of gas and the production of a much less quantity of lampblack. Still in the larger plants there was more than enough for fuel purposes. This was made into lampblack briquettes and used experimentally in the manufacture of water gas, the briquettes being substituted for the Welsh anthracite coal, formerly used.

It was afterwards found that it was unnecessary to briquette the lampblack, but that it could be taken from the pile where it has been allowed to drain and used without further preparation. This improvement solved the problem of the disposal of lampblack and the larger works of the Company are now equipped with lampblack water gas apparatus and the gas made consists of about 70% of oil gas and 30% of lampblack water gas with no remaining residuals. Six of these lampblack generators are used in San Francisco.

In Oakland, where the first large oil gas units were installed and where many of the most valuable improvements in oil gas manufacture were made, there are two 16′ oil gas sets and one 16′ Lowe oil gas set, supplemented by two lampblack water gas sets.

In all the other cities and towns where gas works are operated the latest improvements in oil gas manufacture have been adopted and are in use, as the plants increase in size to a point where an excess of lampblack accumulates, water gas generators will be installed to make profitable use of it. The treatment of oil gas after it leaves the generator is of the utmost importance and this Company has adopted a system of scrubbing, which cleanses the gas of any particles of lampblack or unfixed tarry matter which might cause annoyance in distributing the gas to the consumers. Where salt water is available it is used in large quantities for scrubbing, and in the interior cities and towns on rivers, fresh water is used.

The subsequent purification of the gas for the removal of sulphur impurities has also been a study of the Company, which has resulted in the invention and introduction of large Redwood purifiers, constructed in cylinder shape 30' in diameter and 9' deep. These purifiers are fitted with grooved staves through which water circulates, thus insuring tightness, and the oxide of iron which is placed in a single layer in the purifiers, is revived in place by drawing air downward through it, either by gas fans or steam jet exhausters. These purifiers are efficient, simple of operation, cheap of construction and as they are located out of doors, without covering of any kind, the danger of explosion is entirely eliminated.

As the gas output has increased in the different towns, larger storage holders have been constructed to meet the requirements, and during the last five years a 2,000,000 cubic ft. holder, resting in a steel tank above the ground, has been built in Oakland; a 500,000 cubic ft. holder in Sacramento; 300,000 ft. holder in Fresno; 500,000 ft. holder in San Jose; a 150,000 cubic ft. holder in Vallejo; holders of 100,000 cubic ft. capacity in San Rafael and Santa Rosa; and holders of 150,000 cubic ft. capacity in Petaluma and 100,000 cubic ft. in Chico which will be installed this summer. At the present time there is under construction in San Francisco, a 5,000,000 cubic ft. holder in a steel tank above ground. This holder has a tank diameter of 195' and a guide frame which will reach a height of 225' from the ground.

DISTRIBUTING SYSTEM

The Company was the pioneer in the distribution of gas under high pressure, both in direct use of high pressure, with individual governors, and in a general system of high pressure feeding by district governors into the low pressure systems of the several companies; and has instituted many improvements in the compression and distribution of high pressure gas, notably that of the auto-enricher for replacing the candle power which is lost in the compression process.

Grass Valley and Nevada City distribute gas under high pressure through a system of small steel mains and the pressure is reduced by individual regulators at each consumer's meter. These towns are supplied with gas made in one gas works located at Grass Valley.

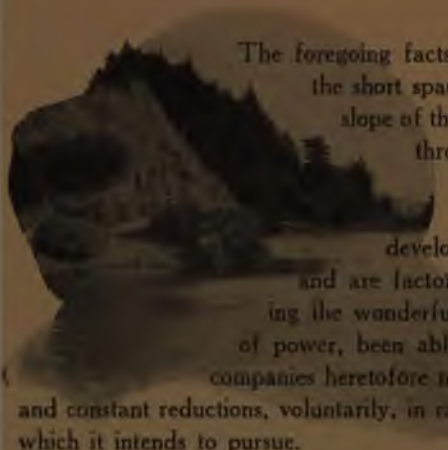
Fresno was originally supplied with gas through a low pressure system of pipes, of small diameter, but the increase in the use of gas, and the rapid growth of the town caused the construction of what is known as a high pressure loop. This loop is a 2" steel high pressure pipe surrounding the gas consuming district, and the high pressure gas is fed through district governors into the business portion of the town, while the outlying districts are supplied through small pipes and individual governors under high pressure. The town of Petaluma is supplied by a high pressure distributing system with gas made at Santa Rosa and pumped through a two-inch steel main 17.8 miles long. In Sacramento the main portion of the city is supplied by a low pressure system, while the outlying districts are supplied by high pressure through an independent system. San Rafael is a low pressure district, but the towns of San Anselmo and Ross Valley are supplied with high pressure gas, through steel mains 2 inches in diameter. The advantages of high pressure distribution have probably been most appreciated in the City of Oakland, where the increase in the gas business has been sudden and pronounced. Had it not been for high pressure, it would have been necessary to have reconstructed the low pressure system of Oakland, but with the aid of high pressure, good service was maintained, and the low pressure system was reinforced without haste or any wasteful expenditure of money.

Berkeley is supplied with gas through a 10-inch steel high pressure main, extended from the gas works known as Station "B" in Oakland, a distance of six miles. Other portions of Oakland are also supplied with high pressure gas and the towns of San Leandro and Hayward are thus supplied, a distance of over fifteen miles. The entire peninsula south of San Francisco extending as far as Palo Alto, a distance of thirty-two miles, is supplied through a 4-inch steel high pressure main extending from Martin Station in Visitacion Valley. The gas used on the Peninsula is made at the Potrero Gas Works in San Francisco and is pumped to Martin Station through a 12-inch steel main, and at Martin Station the pressure is raised to a point necessary for the supply of the peninsular towns. The low pressure distributing system of San Francisco, together with a high pressure system supplying the districts of Richmond and Parkside, has recently been reinforced by a 16-inch high pressure main, extending from the Potrero Station to the 2,000,000 cubic ft. storage holder at North Beach Station. This main is 7½ miles long and is geographically so located that it can feed into the business district of the town, or outward into the residence districts, and be a source of supply to the rapidly growing gas business in the western portions of the city. This main is also used to fill the North Beach storage holder without raising the pressure on the distributing system of the city.

STOCKTON WATER SYSTEM

As a further illustration of the diversified interests of the corporation, it controls and operates the Stockton Water Company, supplying the city of Stockton with water for domestic purposes. The water is obtained from artesian wells, 18 in number, having a depth of from 250 to 1,100 feet. The water is pumped directly into the mains by the Holly system. There is a large concrete reservoir in connection with the works, having a capacity of approximately 1,250,000 gallons; also a steel tank, at an elevation of 110 feet, having a capacity of 200,000 gallons. The main plant is steam operated, oil being used as fuel. The system of mains covers the city of Stockton. A second station is operated by electrically driven pumps, and is used only as an auxiliary in the summer time, for means of additional pressure and supply, due to the large amount of water used in the city through the summer months.

CONCLUSION



The foregoing facts and figures afford the best conception possible of what has been accomplished in the short space of fifteen years, in the development of the hitherto unheeded power on the western slope of the Sierra Nevada Mountains, and in the growth of the Company. It has made possible, throughout the entire north central part of the State of California, lower rates for electricity, than in any other district in the world, and has promoted manufactories that would not have been possible without the cheap power rate created by the development of these enormous industries. Urban and interurban railways have been developed and are factors in the growth of our State, both as freight and passenger carriers. Notwithstanding the wonderful output of oil from the fields of California, it has not, as fuel for the generation of power, been able to compete with water-power plants. By reason of the consolidation of the several companies heretofore named, the market for power and lighting in the central part of the State is controlled, and constant reductions, voluntarily, in rates, are evidence of the policy which has governed the Company at all times and which it intends to pursue.

The stations of the corporation, both gas and electric, are built of fire-proof material, principally reinforced concrete, and equipped with all modern devices known to science.

As a natural condition resulting from pioneer work, some of the hydro-electric power houses listed are small in capacity; but in the early days of hydro-electric development, such generators and water wheels as are possible to-day, were not designed.

All these years, also, in order to provide against dry seasons, it has been necessary to construct large reservoirs, holding a sufficient amount of water to take care of any extraordinary low water season, and thus keep in perpetual motion the water wheels and generators that have their initial power in the glittering snows on top of the Sierra Nevada Range. It may be possible, some day, for man to utilize the tremendous energy of power in the fog banks, that flow over the central portion of our State, at certain seasons of the year, but until that time the snows and rains alone, will create the electric energies necessary for the welfare of this State.

From an original transmission line of 22 miles, the enormous system of power transmission—gas and electric generation and distribution, considering area, consumers served, total installed capacities in power plants, gas works, and water systems—has grown into proportions having no parallel in the world.

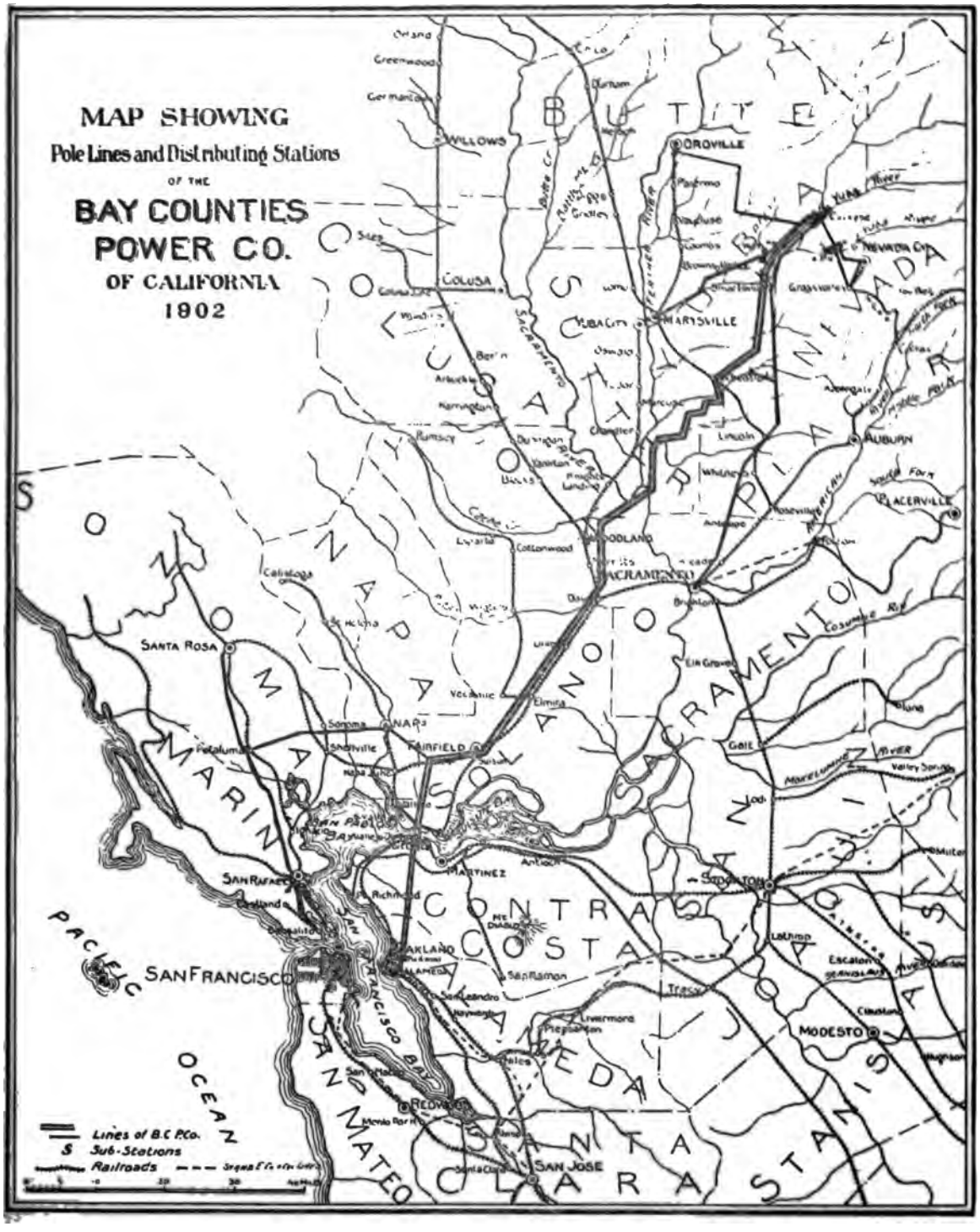
The illustrations on the following pages afford but a brief prospect of the diversified interests making up the entirety of the Pacific Gas and Electric Company. They are, however, intended to represent distinctive features of the several plants, as well as to illustrate a number of the industrial concerns furnished with electric energy and gas.

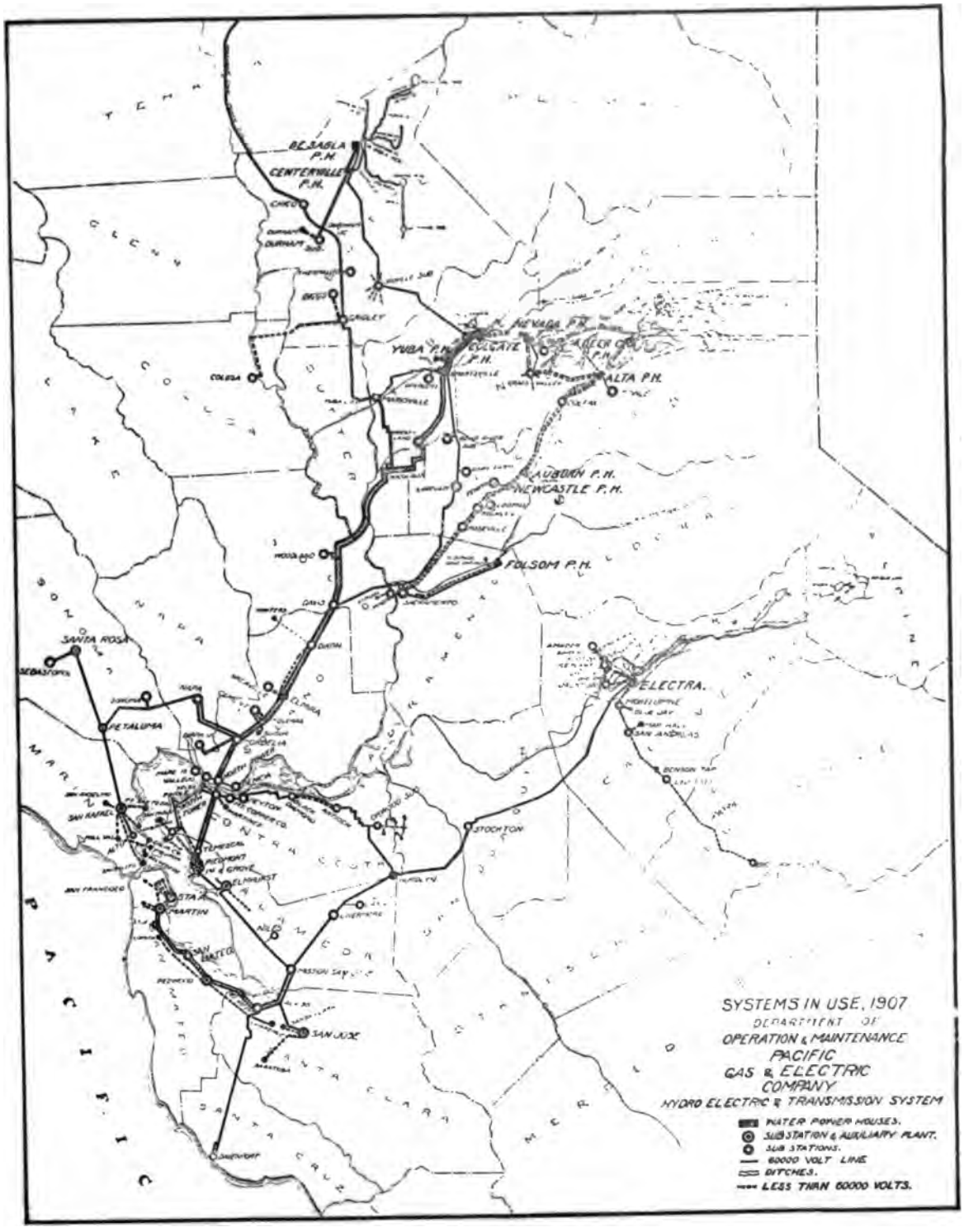
While not geographically set forth in every detail, the views of the power houses, lakes, ditches, and canals are first shown, these being located on the western slope of the Sierra Nevada Mountains, and the pictures thereafter represent the gradual development through the San Joaquin and Sacramento Valleys, following the main transmission lines as shown on map, and exhibiting views of cities and towns directly served from these transmission lines, which are supplied also with gas from works located in distinctive centers.

The views finally conclude an exhibition of the work that has been done in the last five years in the City and County of San Francisco, in its rehabilitation following the fire of April 18th, 19th, and 20th, 1906.

John A. Britton

Vice-President and General Manager


MAP SHOWING
Pole Lines and Distributing Stations
OF THE
BAY COUNTIES
POWER CO.
OF CALIFORNIA
1902
BUTTE
COLUSA
SUTTER
YUBA
NEVADA
PLACER
SACRAMENTO
SOLANO
NAPA
SONOMA
MARIN
CONTRA COSTA
ALAMEDA
SAN MATEO
SANTA CLARA
STANISLAUS
SAN JOAQUIN
OROVILLE
WILLOWS
COLUSA
MARYSVILLE
NEVADA CITY
AUBURN
PLACERVILLE
WOODLAND
SACRAMENTO
SANTA ROSA
PETALUMA
NAPA
VALLEJO
FAIRFIELD
MARTINEZ
SAN RAFAEL
OAKLAND
SAN FRANCISCO
SAN LEANDRO
LIVERMORE
STOCKTON
MODESTO
SAN JOSE
REDWOOD
PACIFIC OCEAN
SAN FRANCISCO BAY
Lines of B.C.P.Co.
Sub-Stations
Railroads


BELDEN P.H.
CENTERVILLE P.H.
DE SABLA P.H.
YUBA P.H.
COLGATE P.H.
ALTA P.H.
AUBURN P.H.
NEWCASTLE P.H.
FOLSOM P.H.
ELECTRA.
STOCKTON
SAN JOSE
SANTA ROSA
PETALUMA
SYSTEMS IN USE, 1907
DEPARTMENT OF
OPERATION & MAINTENANCE
PACIFIC
GAS & ELECTRIC
COMPANY
HYDRO ELECTRIC & TRANSMISSION SYSTEM
WATER POWER HOUSES.
SUB STATION & AUXILIARY PLANT.
SUB STATIONS.
60000 VOLT LINE
DITCHES.
LESS THAN 60000 VOLTS.

GROUP OF OFFICERS, PACIFIC GAS AND ELECTRIC COMPANY.

Upper Left: John S. Drum, Director.

Upper Center: John A. Britton, Vice-president and General Manager.

Upper Right: E. J. De Sabla, Jr., Director.

Left Center: W. R. Eckart, Consulting Engineer.

Center: John Martin, Director.

Right Center: Garrett W. McEnerney, Chief Counsel.

Lower Left: D. H. Foote, Secretary.

Lower Center: F. B. Anderson, Director.

Lower Right: A. F. Hockenbeamer, Second Vice-president, Treasurer and Comptroller.

GROUP OF ENGINEERS, PACIFIC GAS AND ELECTRIC COMPANY.

Upper Left:	S. J. Lisberger, Engineer of Electric Distribution.
Upper Left Center:	P. M. Downing, Engineer, O. & M., Hydro-Electric Section.
Upper Right Center:	Geo. C. Holberton, General Manager, San Francisco Gas and Electric Company.
Upper Right:	H. C. Vensano, Civil Engineer.
Lower Left:	E. C. Jones, Engineer, Gas Department.
Lower Left Center:	C. F. Adams, Engineer Electric Construction.
Lower Right Center:	J. H. Wise, Consulting Engineer.
Lower Right:	F. H. Varney, Engineer, O. & M., Steam and Gas Engine Section.

Group of Head of Departments, Pacific Gas and Electric Co.

Upper Left: Geo. C. Robb, Superintendent of Supplies

Upper Left Center: R. J. Cantrell, Property Agent.

Upper Right Center: J. H. Hunt, Purchasing Agent.

Upper Right: E. B. Henley, Manager, Land Department.

Left Center: F. E. Cronise, Manager New Business and Contract Departments.

Center: J. C. Love, Auditor.

Right Center: J. P. Coghlan, Manager, Claims Department.

Lower Left: S. V. Walton, Manager, Commercial Department.

Lower Left Center: W. B. Bosley, Attorney.

Lower Right Center: W. H. Kline, General Agent.

Lower Right: H. Bostwick, Secretary to President.

THE Pacific Gas and Electric Company publishes a monthly company magazine, containing on an average, 32 pages of reading matter; the articles being written entirely by the 3,500 odd employees.

This magazine was started in June, 1909, with an issue of 3,500 copies, which were distributed gratis to the employees. The original object in publishing this magazine was to furnish knowledge to the different districts and divisions of the company scattered over 32,431 square miles, of improvements, betterments and general conditions prevailing in the other departments, in order to solidify the entire organization, and bring all employees into closer touch.

Since its inception, the magazine has taken on a semi-technical tone, on account of the high-class articles that have been contributed, and has become a source of general information, and an educational feature to all employees.

In addition to the 3,500 odd copies distributed gratis to employees, there are published over 1,000 extra copies per month, a portion of which is on a paid subscription basis, the balance being distributed as an advertising medium.

A special illustrated number, featuring San Francisco, was issued in December, 1910. This consisted of 12,000 copies, about 8,000 of which were distributed throughout the United States.

A fac-simile cut of the cover of the January, 1911 number, is shown on the following page, and grouped on these pages are a number of miniatures of engineers, heads of departments and employees of the different districts, who have, in addition to their other duties, faithfully and regularly contributed interesting articles, of a technical and general nature.

The Vice-President and General Manager acts as editor, and the Treasurer, as business manager, while the Stationery Department handles the necessary details of make-up and distribution of the magazine. Fourteen pages of paid advertisements partially pay the cost of publication.

D. Keppelmann

E. B. Langtry

F. A. Leach, Jr.

W. E. Meservey

R. S. Miller

W. R. Morgan

P. W. McKillip

H. F. Pitts

E. B. Price

Austin J. Rix

L. Roseveare

PACIFIC GAS AND ELECTRIC MAGAZINE

PUBLISHED MONTHLY BY
PACIFIC GAS AND ELECTRIC COMPANY
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S. Schwartz

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S. A. Wardlaw

G. N. Stroh

J. U. Smith

L. H. Suenson

A. Trowbridge

A. Warbarton

F. R. Shipley

W. S. Yeager

C. E. Young

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A. F. Hockenbeamer..2d Vice-Pres., Treas. and Comp.
D. H. Foote.....Secretary
Charles L. Barrett.....Asst. Secretary
W. R. Eckart.....Consulting Engineer
J. H. Wise.....Consulting Engineer
George C. Holberton.Engr. & Gen. Mgr. S.F.G.&E.Co.

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W. H. Kline.....General Agent
R. J. Cantrell.....Property Agent
George C. Robb.....Supt. of Supplies
J. H. Hunt.....Purchasing Agent
E. B. Henley.....Manager Land Dept.
J. P. Coghlan.....Manager Claims Dept.
S. V. Walton.....Manager Commercial Dept.
J. C. Love.....Auditor
W. B. Bosley.....Attorney
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H. Bostwick.....Secretary to President
S. J. Lisberger.....Engr. Electric Distribution
F. E. Cronise.....Manager New-Business Dept.
C. J. Wilson.....Asst. Engr. Electric Distribution
H. C. Vensano.....Civil Engineer
E. C. Jones.....Eng. Gas Dept.
H. P. Pitts.....Industrial Engineer
Sherwood Grover.....Asst. Engr. Gas Dept.
C. F. Adams.....Engr. of Electric Construction
P. M. Downing.....Engr. O. & M. Hyd.-Elec. Sect.
F. H. Varney..Engr. O. & M. Steam & Gas Eng. Sect.

DISTRICT MANAGERS

Alameda County.....F. A. Leach, Jr.
Antioch.....F. J. Southerland
Berkeley.....F. A. Leach, Jr.
Chico.....H. B. Heryford
Colusa.....W. M. Henderson
Dixon.....C. E. Sedgwick
Fresno.....E. W. Florence
Grass Valley.....John Werry
Martinez.....Don C. Ray
Marysville.....J. E. Poingdestre
Napa.....O. E. Clark
Nevada City.....John Werry
Newman.....W. A. Widenmann
Oakland.....F. A. Leach, Jr.
Petaluma.....H. Weber
Redwood City.....L. H. Newbert
Sacramento.....C. W. McKillip
San Jose.....J. D. Kuster
San Rafael.....W. H. Foster
Santa Rosa.....M. G. Hall
Vallejo.....A. J. Stephens
Woodland.....W. E. Osborn

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Nevada (Nevada City).....George Scarfe
Placer County (East Auburn)..H. M. Cooper
Standard (Electra).....W. E. Eskew
Stockton (Stockton).....J. W. Hall

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De Sabla.....I. B. Adams
Electra.....W. E. Eskew
Marysville.....C. E. Young
Nevada City.....George Scarfe
North Tower.....C. D. Clark
Oakland.....William Hughes
Sacramento.....J. O. Tobey
San Jose.....J. O. Hansen
South Tower.....A. H. Burnett
Stockton.....E. C. Monahan
Solano.....J. W. Coons, Acting

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Sacramento.....C. R. Gill
San Jose.....A. C. Ramsted
San Francisco.....A. R. Thompson
Oakland & Alameda (Overhead).A. H. Brandt

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Martin Station.....John Mitchell
Oakland.....A. C. Beck
Sacramento.....Edward S. Jones
San Francisco.....Dennis J. Lucey
San Jose.....R. H. Hargreaves

SUPERINTENDENTS OF GAS DISTRIBUTION

Oakland.....George Kirk
San Francisco.....W. R. Morgan

THE PACIFIC GAS AND ELECTRIC COMPANY

SUPPLIES HEAT, LIGHT AND POWER TO

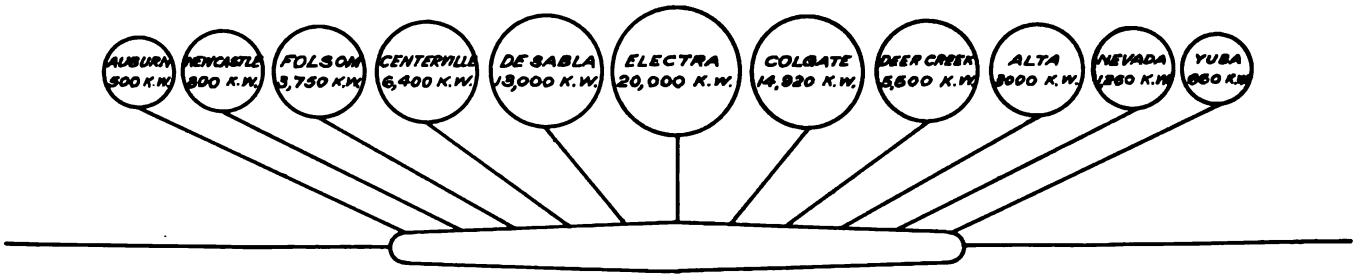
PLACE	POPULATION
Agua Caliente	50
*Alameda	23,383
**Albany	800
‡Alta	200
Alto	30
Alvarado	200
Allegheny	200
Amador	200
Angels Camp	3,200
Antioch	3,000
‡Auburn	2,376
Baden	1,500
Barber	200
**Belmont	600
Belvedere	481
Benicia	3,360
Ben Lomond	800
**Berkeley	40,434
Bethany	200
Big Oak Flat	150
Biggs	750
Black Diamond	500
Bohemian Grove	25
Brentwood	200
Brighton	100
Broderick	500
‡Brown's Valley	50
**Burlingame	5,000
Byron	200
Campbell	1,000
Camp Meeker	200
Cement	1,500
Centerville	500
‡Centerville	20
**Chico	13,000
Chittenden	50
**Colusa	1,582
‡Colfax	400
Colma	500
Concord	1,500
Cordelia	150
Corte Madera	350
Cordova	25
Cornwall	300
Crockett	2,500
Crow's Landing	375
Davenport	1,000
Davis	750
Decoto	350
Dixon	1,000
Dobbins	50
Drytown	100
Duncan Mills	150
Durham	500
‡Dutch Flat	400
Eagle Nest	50
‡East Auburn	1,500
**Easton	500
**East San Jose	1,500
Eckley	20
Eldridge	1,000
‡Electra	50
Elmira	150
El Verano	100
Emerald	50
**Emeryville	2,000
Encinal	20
Fairfax	250
Fairfield	800
**Fair Oaks	250
Folsom	1,500
Forestville	100
*Fresno	24,892
Gilroy	2,000
Glen Ellen	500
Gold Run	100
Grafton	350
†Grass Valley	4,520
Gridley	1,800
Groveland	50
Guerneville	500
Hammonton	500
Hayward	4,000
Hollister	3,000
Ignacio	50
Ione	900
Irvington	1,000
Jackson	2,035
Jackson Gate	50
Kennedy Flat	50
Kentfield	200
Knight's Landing	350
Larkspur	594
Lawrence	100
‡Lincoln	1,402
‡Live Oak	200
Livingston	200
Livermore	2,250
‡Loomis	150
Los Altos	200
Los Gatos	3,000
Manlove	50
Mare Island	500
Martell	25
Martinez	5,000
**Marysville	5,430
Mayfield	1,500
Mayhew	50
**Menlo Park	1,500
Meridan	300
Middle River	75
Mill's College	150
**Milbrae	300
Mills	350
Mill Valley	2,551
Mission San Jose	500
Mokelumne Hill	150
Monte Rio	50
Mountain View	2,500
**Napa	5,791
Napa Junction	250
‡Nevada City	2,689
Newark	700
†Newcastle	600
New Chicago	25
Newman	1,000
Niles	800
Novato	250
**Oakland	225,000
**Oak Park	8,000
Occidental	400
Ophir	50
Oroville	2,500
Orwood	50
Oswald	25
Pacheco	200
**Palo Alto	6,000
Patterson	100
**Penon Blanco	25
†Penryn	250
Perkins	200
**Petaluma	5,880
Peyton	250
**Piedmont	2,000
Pike City	200
Pinole	1,500
Pleasanton	2,000
Port Costa	600
**Redwood City	3,500
Richmond	6,802
Rio Vista	200
†Rocklin	1,026
Rodeo	100
‡Roseville	2,608
Ross	556
Routier	30
***Sacramento	52,000
San Andreas	200
San Anselmo	1,531
San Bruno	1,500
San Carlos	100
**San Francisco	416,912
**San Jose	40,000
San Juan	150
San Leandro	4,000
San Lorenzo	100
**San Mateo	7,000
San Pablo	1,000
**San Quentin Prison	1,600
**San Rafael	5,934
Santa Clara	8,000
Santa Cruz	11,146
**Santa Rosa	7,817
Saratoga	200
Sargent	50
Sausalito	2,383
Sebastopol	1,233
Selby	100
Smartsville	300
Sonoma	1,200
So. San Francisco	2,500
Stanford University	2,000
Stege	100
†Stockton	23,253
Suisun	1,200
Sunnyvale	2,000
Sutter Creek	2,000
Telton	300
Terminus	50
Tiburon	100
Tormey	150
†Towle	200
Tracy	1,200
Vacaville	1,177
**Vallejo	11,340
Vallejo Junction	10
Vernalis	50
Vineburg	200
Walnut Creek	350
Warm Springs	200
Watsonville	4,446
Wheatland	1,400
Winters	1,200
**Woodland	3,187
Yolo	350
**Yuba City	1,160

*—Gas	48,275
**—Gas and Electricity	824,042
‡—Electricity and Water	34,685
***—Gas, Electricity and Street Car Service	52,000
†—Electricity, Gas and Water	7,209
Unmarked—Electricity only	143,230
	1,109,441

Service Furnished.	Number of Towns.	Total Population.
Electricity	204	1,061,166
Gas	52	931,526
Water	19	41,894
Street Car	1	52,000

INDUSTRIES SUPPLIED FROM HYDRO-ELECTRIC PLANTS

ALL of the industrial enterprises illustrated and described on the following pages are customers of the Pacific Gas and Electric Company and are supplied by it with gas and electricity for motive power. The views shown represent but a small proportion of industrials served; the scope of which may be judged by the following list.



Amusement parks
Breweries
Brick plants
Boiler shops
Blue printing apparatus
Barrel factories
Basket factories
Barber shops
Can factories
Cement plants
Chemical plants
City sewerage plants
City water works
Coffee mills
Cooking devices
Cold storage plants
Creameries
Cracker factories
Conveying machinery
Candy factories
Carpet factories
Cleaning works
Cornice works

City street lighting
Commercial lighting
Cotton machinery
Creameries
Dental motors
Dredges
Elevators
Elevator factories
Electric automobiles
Electric railways
Electro chemical
Fans
Feed Mills
Flat irons
Flour mills
Foundries
Fruit Canneries
Fruit packing plants
Fruit pre-cooling plants
Fence works
Gas engine factories
Gas works
Glove factories

Grain elevators
Heating devices
Hat factories
Hairdresing parlors
Ice Cream plants
Ice-making factories
Incubator factories
Iron works
Irrigation
Jute mills
Knitting factories
Laundries
Machine shops
Mattress factories
Meat cutters
Macaroni factories
Magnet cranes
Marble factories
Mines
Moving picture machines
Navy yards

Nickel and silver plating
Oil-pumping plants.
Oil-refining plants
Paint factories
Paper mills
Planing mills
Printing presses
Publishing houses
Pump factories
Pumping plants
Plumbing manufactories
Pipe manufactories
Quarries
Residence lighting
Rolling mills
Rock crushers
Rubber factories
Safe factories
Salt-refining plants
Saw mills
Sewing machines
Shoe factories
Slaughter houses

Smelters
Steam engine factories
Sugar refineries
Shirt and collar factories
Sash and door factories
Ship yards
Spice factories
Traveling cranes and hoists
Tin works
Telephones
Telegraphs
Tanneries
Terra Cotta works
Vacuum cleaning systems
Washing machines
Wineries
Woolen mills
Wood-working plants
Welding Apparatus
Wire works
Wood yards
X-ray machines
Yeast and vinegar works

Upper Left — Interior view of Centerville Power House on Butte Creek, Butte County, five and one-half miles below the De Sabla Power House, showing generators in the foreground. The building is constructed of concrete, steel and corrugated iron.

Upper Right — Main canal leaving the Butte Diversion Dam one mile east. The water is picked up from Butte Creek, ten miles above the De Sabla Power House, supplemented by the Hendricks Ditch (twenty-two miles long) which enters Butte Ditch Creek about one mile above the De Sabla Reservoir, and delivers into the reservoir an average of 7,000 miner's inches of water for use in the De Sabla Power House.

Center — Forebay showing entrance of water from the Butte Ditch into the De Sabla Reservoir, which is located at what is known as Camp No. 1 on the mountain above the De Sabla Power House. This is a receiving and storage reservoir and contains 11,500,000 cubic feet of water.

Lower Left — Interior view of De Sabla Power House, Butte County, showing the location of four units, which make up the total 17,427 H. P., generated at this plant; and view of forty-ton crane for the lifting of heavy portions of machinery incidental to repairs and the installation of new units.

Lower Right — Bird's-eye view of De Sabla Power House in Butte Creek canyon, with the headquarters house in the distance. The main pipe line feeding this power house extends down the mountain side on the right, from the reservoir at Camp No. 1. The power house works under a 1,531 ft. head. The 60,000 volt transmission lines from the De Sabla Power House parallel Butte Creek to the Centerville Power House, five and one-half miles below; the lines separating near this point, one extending to the southeast and tying into the Bay Lines in Yuba County, and the other extending to the southwest, supplying Chico, Durham, Gridley, Colusa, Meridian and intermediate points, and returning east to Marysville; thence south, and again tying into the Bay Lines at Nicolaus.

KEY TO
ILLUSTRATIONS

Upper Left: GOLD dredge on Butte Creek, Butte County, about midway between Chico and the Centerville Power House, and which is operated by electricity.

Upper Right: Centerville Power House on Butte Creek, Butte County, five and one-half miles below the De Sabla Power House; the water for which is picked up from Butte Creek, about two hundred yards below the De Sabla Power House, being practically the same water that passes through the De Sabla Power House, and after being used in the Centerville Power House, is again thrown off into Butte Creek.

Left Center: Interior view of Centerville Power House showing water-wheel and switchboard. This power house is equipped with two units, the power being fed into the main De Sabla line.

Right Center: Machine shop at dredge camp on Butte Creek, which cares for the repairs of the gold dredge described above.

Lower Left: On the Chico-De Sabla road up Butte Creek Canyon, showing the power lines from the De Sabla and Centerville Power Houses.

Lower Right: Camp No. 1, De Sabla, taken from the crest of dam which forms the forebay reservoir for the De Sabla Power House; showing standpipes on the main pipe lines.

KEY TO
ILLUSTRATIONS

Upper Left: MAIN street in Chico, Butte County, in the northern end of the Sacramento Valley, which has a population of 13,000 inhabitants, and is on the main line of the Southern Pacific Railroad, "Shasta Route", and the northern terminal of the Northern Electric Railway.

Upper Right: State Normal School at Chico, with an average attendance of over 300 students. The grounds comprise eleven acres, devoted to athletics and general recreation, and also contain an experimental agricultural station. The curriculum consists of standard branches, elementary training and the instruction of teachers in normal and domestic sciences.

Left Center: Chico sub-station and outside switches. This station is located adjacent to the shops of the Northern Electric Ry. Co., and cares for the load used by that company and also the lighting and power load used in Chico and adjacent territory. The building is new, of concrete construction and is fireproof. The current is received from the De Sabla-Centerville Lines.

Right Center: Plant of the Diamond Match Company, located at Barber, just outside of Chico; the largest institution of its kind on the Pacific Coast. This concern not only manufactures matches, but does a general mill, iron and wood-working business, owns immense pine forests in the extreme northern end of Butte County,—operates a large sawmill at Stirling City and owns its own railway line for the hauling of lumber from Stirling City into Chico. This plant is operated almost entirely by electricity.

Lower Left: Street scene, Chico, showing open type cars operated by the Northern Electric Ry. Co. within the city limits.

Lower Right: Car house and shops of the Northern Electric Ry. Co., with large interurban cars in the foreground, which operate between Chico and Marysville, Oroville, Sacramento and intermediate points; the current for the entire system being supplied by the Pacific Gas and Electric Company.

KEY TO
ILLUSTRATIONS

Upper Left: DAM of Upper Blue Lakes, Amador County, capacity 293,859,766 cubic feet. One of the reservoirs supplying water to the Electra Power House.

Upper Center: Outlet, showing face of Upper Blue Lakes Dam, on the Electra Power House system.

Upper Right: Dam at Lake Sterling reservoir, Nevada County, capacity 71,800,000 cubic feet, the waters from which feed into Lake Fordyce, thence into the canals of the South Yuba Water system.

Left Center: Canyon Creek Reservoir, Placer County, capacity 850,000 cubic feet, into which the Towle ditch empties; thence to the Alta Power House Forebay Reservoir; being part of the South Yuba Water system.

Center: Hendricks Head Dam at the head of the Hendricks Ditch in Butte County, the waters from which pass into the Butte Ditch, thence into the De Sabla Reservoir at Camp No. 1, De Sabla.

Right Center: Spillway Dam, Kidd Lake, Placer County, showing logs against face of dam, after winter season.

Lower Left: Meadow Lake, Nevada County, capacity 200,000,000 cubic feet, the waters of which feed into Lake Fordyce, thence into the South Yuba Water system.

Lower Right: Face of Bear River Dam and Reservoir, Amador County; capacity 267,054,000 cubic feet at the head waters of Bear River, one of the sources of supply for the Electra Power House.

COLGATE Power House in Yuba County. This picture shows the pipe lines which extend down the side of the mountain and carry the water for this plant. This power house has been extended on the left, where excavation work is shown in the illustration.

FOUR miles of the entire eight miles of flume, which carries water picked up from the Middle Fork Yuba River, for the Colgate Power House.

KEY TO ILLUSTRATIONS

Upper Left: SUB-STATION at Hammonton, Yuba County, at which point are located the shops of the Yuba Consolidated Gold Fields Company. This station was installed to care for the gold dredges, operated by the above company on the Yuba River. The current is received from the main Bay Lines.

Upper Right: Street scene in Marysville, Yuba County, located in the north center of the Sacramento Valley, at the junction of the Yuba and Feather Rivers. This city has a population of 6,250 and is on the main line of the Southern Pacific Railroad, and the Northern Electric Ry. It is the distributing point for the farming districts of Yuba and Sutter Counties.

Center: Marysville Gas Works on the left and new concrete sub-station to the right, with the Sperry Flour Mills in the distance. This gas works has a capacity of 350,000 cubic feet per day. The sub-station cares for the lighting and power load of the city of Marysville, Yuba City, across the river, and vicinity. The electric current for this territory is received from the De Sabla-Centerville Lines, and the Bay Lines.

Lower Left: Sperry Flour Mill, Marysville, the machinery of which is electrically operated. This mill has a capacity of 600 barrels per day.

Lower Right: Gold dredge, operating in the great gravel basin of the Yuba River. These dredges are erected on large scows, dig out their own channels in the enormous gravel deposits, throwing the gravel to one side in huge piles, after the gold has been extracted. They are all operated by electricity, through the Hammonton sub-station, as above described.

TWO gold dredges operating in the gravel beds of the Yuba River, near Marysville. There are being operated, at the present time (by the several dredging companies in the vicinity of Oroville, Marysville and Folsom) twenty-two of these dredges, having a total motor installation of 6,975 H. P.

Nearly all of these dredges are operated by electricity, furnished from the transmission lines of this Company.

SNOW scenes taken along the line of the Central Pacific Railroad, at the summit of the Sierra Nevada Mountains, which traverse the extreme eastern border of California. These illustrations are representative of the enormous snow fall in these mountains every winter, which begins about the first of December, and extends into March. The snow in some places is twenty-five feet in depth, and this enormous fall, due to weight, packs the greater portion of snow to the consistency of ice, and the hard snow remains on the ground until the following August and September. This hard snow—which melts during the summer—is the source of the great water supplies, which are used in the operation of the hydro-electric power houses.

Upper left

Upper Right

Left Center

Center

Right Center

Lower left

Lower Right

LAKE VERA, in Nevada County, from which high head of Rome Power House is supplied.

KEY TO
ILLUSTRATIONS

Upper Left: FLUME above the Rome Power House on the South Fork Yuba River, Nevada County, which carries water from the head dam to the penstock, thence into the pipe line and through the Rome Power House.

Upper Right: Looking up South Fork Yuba River above the Rome Power House, showing flume on side of the mountain, which carries water as above described.

Center The Rome Power House on the South Fork Yuba River, showing suspension bridge crossing the river, headquarters' house, and pipe lines which bring the water from Lake Vera and the penstock of the lower ditch into this power house. This plant has a total installation of four machines, with a horse-power capacity of 1689.

Lower Left: Another view of flume just below the head dam, where the water is picked up out of the South Fork Yuba River and conveyed to the Rome Power House. This flume has a capacity of 3,160 miner's inches.

Lower Right Section of flume on the Rome Power House system, with patrolman's cabin and waste gate.

KEY TO
ILLUSTRATIONS

Upper Left: NEVADA CITY, Nevada County, population 4,000; view taken from the residence district on the hill back of the main town.

Upper Right: The Nevada sub-station in Nevada City, which cares for the power and lighting load of that district.

Center: Gas Works at Grass Valley, Nevada County, which supplies the town of Grass Valley, and from which point also extends a high pressure pipe line 4½ miles long, furnishing gas to Nevada City. This plant has a capacity of 160,000 cubic feet per day.

Lower Left: Champion Mine on Deer Creek, below Nevada City.

Lower Right: Bird's-eye view of Grass Valley, taken from the ridge back of the Empire Mine. This city has a population of 7,000, and like Nevada City, is one of the oldest mining towns in the State.

HEAD dam on the South Fork Yuba River, where the water for the Rome Power House low head is diverted into the canals.

KEY TO
ILLUSTRATIONS

Upper Left: HOIST operating three cages, at North Star Mine, near Grass Valley, Nevada County.

Upper Right: Cyanide Plant, North Star Mine.

Center: General view of North Star Mine Mill.

Lower Left: Upper Mill, North Star Mine, showing electric ore train.

Lower Right: Power plant, Cyanide Plant and Cyanide Settling Lake, North Star Mine.

The North Star Mine is among the largest properties in Nevada County, employs about 300 men and has 80 stamps. This mine is operated entirely by electricity, and has two most unique installations of specially built turbine pumps, operated by electric motors. Each of these pumps is capable of hoisting 300 gallons of water per minute to the surface, a distance of 1,401 feet from the lower level.

KEY TO
ILLUSTRATIONS

Upper Left: GRASS VALLEY sub-station, Grass Valley, Nevada County, supplied from the Deer Creek, Alta, Nevada and Colgate Power Houses, and which cares for the mining, power and lighting load in the vicinity of Grass Valley and Nevada City.

Upper Right: Mill at the Empire Mine near Grass Valley. The stamps and machinery are electrically operated.

Left Center: Pumping plant of the North Star Mine, which also contains the air compressors, the power for which is supplied through the Grass Valley sub-station.

Right Center: Timber hoist at the mouth of shaft, Empire Mine, near Grass Valley, showing miners leaving the mine on change of shift.

Lower Left: Mill and main hoist of the Empire Mine near Grass Valley.

Lower Right: Residence of the owner and President of the Empire Mine, near Grass Valley. This house is constructed of brick and stone, and the buildings and gardens are among the beauty spots of California.

SECTION of one of the canals in the irrigated district of Placer County, on the South Yuba Water system.

KEY TO
ILLUSTRATIONS

Upper Left: SECTION of flume on the Gold Hill Canal, Placer County, this canal being a part of the South Yuba Water system.

Upper Center: Flume on the Fiddler Green Canal, one-half mile below Lake Arthur in Placer County. This is a portion of the South Yuba Water system.

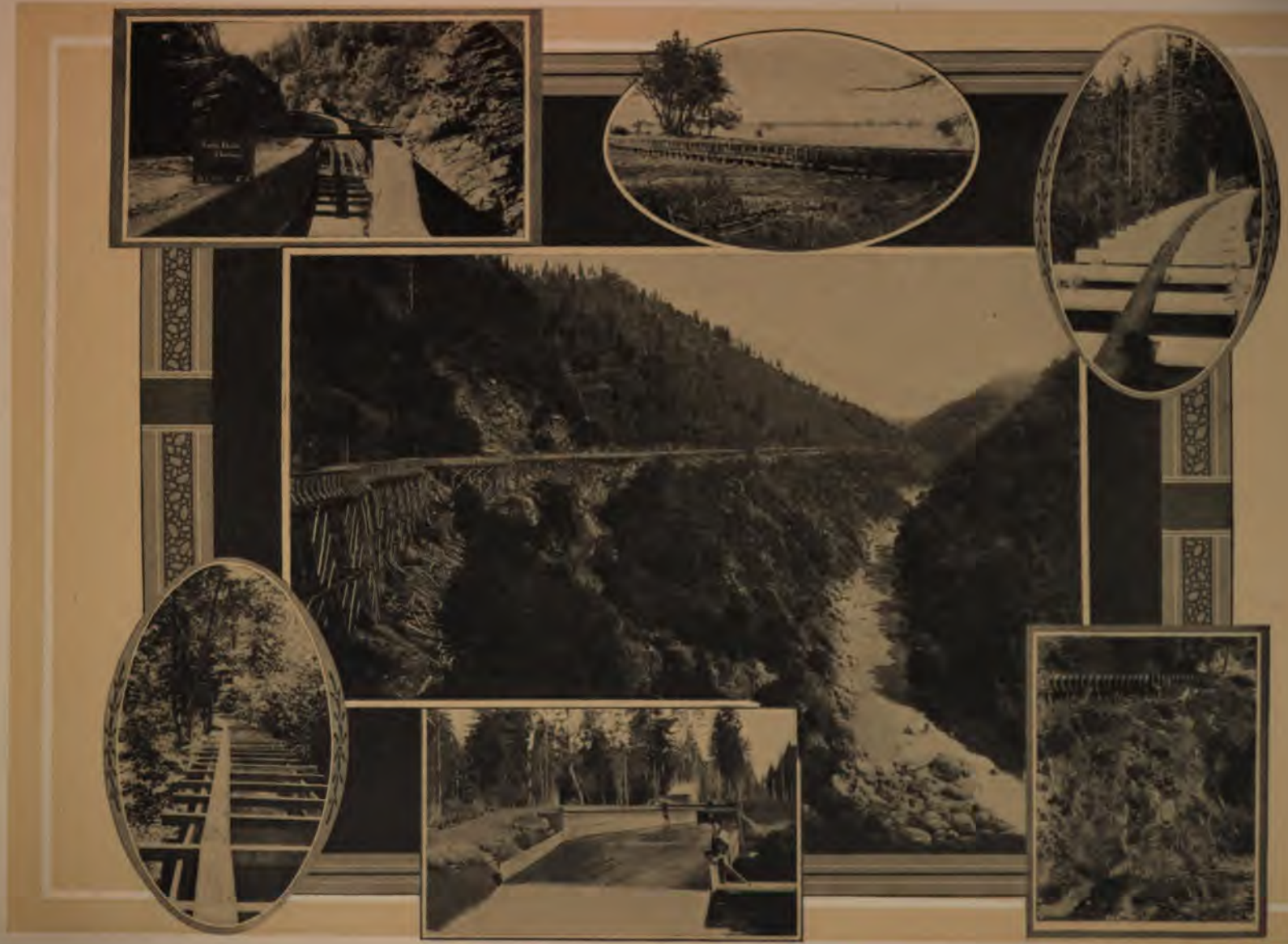
Upper Right: Flume on the Boardman Canal, one-half mile below the Bear Valley Reservoir in Placer County.

Center: Bird's-eye view of four miles of the eight mile flume, above the Middle Fork Yuba River, which carries the main water supply for the Colgate Power House.

Lower Left: Flume on the Cascade Ditch, Nevada County, through which water is carried, via the Banner Ditch and Pittsburg Ditch, into the Leonard, Herring and Alta Hill Reservoirs, located near Grass Valley. These canals are part of the Nevada water division of the South Yuba Water system.

Lower Center: Water spilling out of Butte Ditch into the De Sabla Reservoir.

Lower Right: Section of Colgate Flume, showing waste gate. These waste gates are located at certain intervals along the flume for the purpose of draining the flume, when repair work is being carried on.



KEY TO
ILLUSTRATIONS

Upper Left: ON the shore of Lake Alta, Placer County. This lake has a capacity of 14,000,000 cubic feet, and is one of the numerous storage reservoirs on the South Yuba Water system.

Upper Right: Main South Yuba Canal in Placer County, below Lake Alta. The canal at this point parallels the lines of the C. P. R. R.

Center: The main road near Gold Run, looking across the country traversed by the South Yuba Water system.

Lower Left: Another view of Lake Alta in Placer County.

Lower Right: The upper end of Lake Alta. While the Lake Alta basin is owned by the Pacific Gas and Electric Company, there are numerous summer homes built around the entire circumference of this beautiful mountain lake, and the company permits boating on its waters. Swimming, however, is barred.

UPPER Standard Canal, 18.6 miles long, having its intake above Tiger Creek on the Mokelumne River, Amador County. This canal carries 5,000 miner's inches of water and is the main feeder for the Electra Power House.

Bear River Canal, 32.6 miles in length. This canal is on the South Yuba Water system, and has a capacity of 1,800 miner's inches.

Inskip ditch; a part of the De Sabla Water system. This ditch has a capacity of 1,120 miner's inches.

Section of main South Yuba Canal in Placer County.

Gold Hill Canal, Placer County; part of the South Yuba Water system. This cut shows the canal just after completion.

Auburn tunnel, 650 ft. long, under the city of Auburn, Placer County, which carries the waters of the main South Yuba Canal through the town, which waters are used in the Auburn and Newcastle Power Houses, and in the irrigated orchard districts in the foothills of that county.

Boardman Canal, capacity 3,000 miner's inches, near Auburn, Placer County. This canal is part of the South Yuba Water system, and extends from Bear Valley Reservoir to Roseville, 80 miles; passing through Alta, Auburn and [illegible] Power Houses en route.

[illegible]

[illegible] (...) water from Lake Theodore in Placer County. This lake has a capacity of **15,000,000** [illegible] and is one of the principal storage and regulating reservoirs of the South Yuba Water system.

[illegible] [illegible] Placer County, showing spillway in the foreground. This lake is a mile below Lake Theodore and is also [illegible] regulating reservoirs of the South Yuba Water system.

[illegible] [illegible] one of the large and numerous forest ravines irrigated by water from the main South [illegible]

[illegible] [illegible] in Placer County.

[illegible] [illegible] of the South Yuba Water system, showing settling reservoir, the waters from which are **diverted into the** [illegible] in Placer County, for irrigating the vines and trees of orchard district during the warm summer [illegible]

[illegible] [illegible] Auburn, Placer County, which takes care of the sprinkling need of that town; the current being [illegible] from the lines of the Central California system.

[illegible] Lake Theodore in Placer County, showing the gateway through which the water is diverted into the **main South Yuba** [illegible]

[illegible] [illegible] of the South Yuba Water system near Grid Run. At this point the main canal parallels the tracks of the **Central Pacific Railroad**, and numerous flumes are constructed to carry the waters around precipitous bluffs **and to span deep** ravines

KEY TO
ILLUSTRATIONS

Upper Left: END view of the Auburn Power House below the city of Auburn, Placer County, on the main South Yuba Canal, showing the waters after being used in this power house, thrown off into the canal and carried farther down the mountain.

Upper Right: Canal showing the inflow of water at the upper end of one of the numerous settling and regulating reservoirs, on the South Yuba system.

Center: The South Yuba Canal passing through the fertile foothills orchard district, below the town of Auburn in Placer County.

Lower Left: The Auburn Power House, which has an installation of one unit with a H. P. capacity of 670. The current generated at this power house supplements the main Central California system terminating in Sacramento.

Lower Right: Bird's-eye view of the city of Auburn, county seat of Placer County, with a population of 2,500. Auburn is on the main line of the C. P. R. R., and is the shipping point for the products of a portion of the orchard district in the foothills of Placer County.

KEY TO
ILLUSTRATIONS

Upper Left: OUTDOOR 60,000-volt air and oil switches at the Newcastle Power House, in Placer County. The oil switches are enclosed and protected from the elements.

Upper Right: General view of the Newcastle Power House.

Left Center: Generators and water-wheel in the Newcastle Power House.

Center: Three diverging canals just below the Newcastle Power House, where the waters of the main South Yuba Canal are diverted into branch canals for irrigating purposes.

Right Center: Interior of Newcastle Power House, showing main switchboards and generator.

Lower Left: One of the numerous fruit packing and shipping warehouses located at Auburn, Newcastle, Penryn, Loomis and other towns, where the large crop of peaches, prunes, pears, etc., raised in this district is packed, stored and loaded in refrigerator cars for transportation to eastern markets. The fruit shipments from this district for the season of 1910 were 2,500 cars.

Lower Right: The front end of Newcastle Power House near the town of Newcastle, which has an installation of two units with a total of 1,073 H. P. each. The current generated at this plant, like that from Auburn Power House, is carried forth through the main lines of the Central California system.

KEY TO
ILLUSTRATIONS

Upper Left: INTERIOR of the Folsom Power House, Sacramento County. This plant has five units, H. P. Capacity, 5,028, and the current is fed over the Folsom-Sacramento Line into Sacramento.

Upper Right: Forebay Reservoir, above the Folsom Power House, showing gates on farther wall, by which the flow of water into the Power House is regulated.

Left Center: Folsom Power House on the discharge side. This water after having passed through the Folsom Power House, is picked up and turned into a lower turbine of 1,000 H. P. Capacity, in a small power house farther down, whence it discharges again into the American River. Along the line of the ditch, the Folsom State Prison utilizes a drop of 7 feet, the generators being also operated by steam. The quantity of water is a feature in the operation of these plants in contrast to the high head water pressure used in the De Sabla, Centerville, Colgate, Nevada, Deer Creek, Alta and Electra Generating Plants in the high Sierras. In consequence of this fact, the Folsom Power House uses practically the entire flow of the American River, during the dry season, of 70,000 inches or more.

Center: Water from the Folsom Plant, flowing toward the American River.

Right Center: End view of upper Power House, Folsom, showing the reservoir, and concrete bulkhead, through which the pipe lines pass into the power house below.

Lower Left: View along the main supply ditch for the Folsom Power Plant, looking up the river toward the State Prison. This canal shows the volume of water used in the Folsom Power House.

Lower Right: Wing Dam, near the Folsom State Prison, by which waters of the American River are diverted into Folsom Power House Canal.

KEY TO ILLUSTRATIONS

Upper Left: A PORTION of the Southern Pacific Railway Shops in Sacramento. These shops employ about 3,000 men, and care for the repairing of the entire rolling stock of the Southern Pacific system.

Upper Right: Looking down the Sacramento River, at Sacramento, from the railroad bridge.

Left Center: The river steamer "Apache", which plies between San Francisco, Sacramento and San Joaquin River points.

Center: State Capitol, Sacramento.

Right Center: Steamer "Navajo", one of the river steamers operating on the Sacramento and San Joaquin Rivers.

Lower Left: "K" Street, Sacramento, looking east from Seventh Street, showing the Post Office in the left foreground.

Lower Right: Bird's-eye view of Sacramento, looking out "J" Street, with the Capitol building in the distance.

MAP of Sacramento, Sacramento County, showing the electric street car lines operate Company, and location of our other properties.

There are 43 cars in daily service on these lines, the headway being from 5 of 35.86.

Dotted lines indicate franchises granted, but lines are not yet constructed.

KEY TO
ILLUSTRATIONS

Upper Left: GAS Works and Electric sub-station at Woodland, Yolo County. The current for this sub-station is received from the main Bay Lines, which traverse the Sacramento Valley to the Bay Cities. Capacity of gas works, 180,000 cubic feet per day.

Upper Right: Globe Flour Mills in Woodland, which are operated by electricity, and have a capacity of 250 barrels per day.

Center: Pumping plant for the city of Woodland. The water supply for the city of Woodland is obtained principally by pumping from deep wells.

Lower Left: First National Bank and representative business block, in Woodland.

Lower Right: Street scene in the business section of Woodland, which city has a population of 3,500, and is situated in the farming district of Yolo County, on the west side of the Sacramento Valley and on the west side branch of the Southern Pacific. Woodland is the main distributing point for the enormous agricultural district of that section.

Upper Left: SUB-STATION specially built to care for the electric power used by the Pacific Portland Cement Plant, at Cement, Solano County.

Upper Center: View in the pit, where the rock receives the first crushing before going into the mill.

Upper Right: In the motor room of the Santa Cruz Portland Cement Plant; showing one of the enormous motors which drive the heavy machinery in these plants.

Left Center: Mills of the Standard Portland Cement Company, Napa Junction, Solano County. This mill has a capacity of 2,500 barrels a day, and a motor installation of 3,734 H. P. The current for this mill is received from the main Bay Lines, via the Cordelia branch.

Center: Mills of the Santa Cruz Portland Cement Company, Davenport, Santa Cruz County. This mill has a capacity of 5,400 barrels per day and an installed horse-power in motors of 10,204. The current is received from the Standard system, via Mountain View sub-station, and the transmission lines were specially built to care for this enormous institution.

Right Center: Mills "A" and "B" of the Pacific Portland Cement Company, Cement, Solano County. This plant has a capacity of 6,000 barrels per day, and a motor installation of 4,329 H. P. The current is received from the main Bay Lines, which pass near this property.

Lower Left: View in one of the mills of the Santa Cruz plant; showing the immense rollers in which the material is ground and cooked.

Lower Center: Bunkers where rock is received from the quarries and loaded into cars for transportation to the mills.

Lower Right: One of the compressor and motor rooms in the Santa Cruz plant.

These plants are electrically operated throughout, and have specially built sub-stations adjoining, through which the electric energy, necessary for the operation of the mills, is regulated. These three mills use on an average, 180,000 K. W. per day.

Upper Left: Two of the large tanneries at Benicia, Solano County.

Upper Right: The Southern Pacific ferry steamer, which operates between Benicia, Solano County, on the north side of Carquinez Straits, and Port Costa, Contra Costa County, on the south side of the straits. This ferry steamer is a connecting link in the main line of the Southern Pacific Railroad Company between the above points, and is reputed to be the largest car ferry in the world. Two entire passenger trains with a total of twenty-two passenger coaches and two locomotives, can be transported at one time by this ferry steamer.

Left Center: Butter and milk depot of the Western Creamery Company, located on the water front, at Benicia. This plant is supplied with milk via steamer, from the numerous dairies along the Sacramento and San Joaquin Rivers.

Center: Enormous plant of the Selby Smelting and Lead Company, located on the water front, near Port Costa. This plant carries on a general ore reduction and refining business.

Lower Left: Another view of the Western Creamery Company's plant, at Benicia. This plant is well located between the water front and the railroad tracks, receiving the milk by steamer from up river points, and being able to make ready shipments by rail from its warehouse.

Lower Right: The Benicia Iron Works, at Benicia. This institution manufactures wagons and vehicles of every description. They make a specialty of mountain stages, and plows especially adapted to the needs of the California farmer.

The industrials above mentioned receive light and power from the main Bay Lines.

[illegible]
ILLUSTRATIONS

cover left — STREET scene in Napa.

cover center — Sub-station of the Pacific Gas and Electric Company, Napa. This station is supplied from the Bay Lines, via Cordelia.

cover right — Gas Works in Napa. This plant has a capacity of 240,000 cubic feet per day.

[illegible] — Water front at Napa on the Napa River, showing wharves and small bay schooners, which carry the enormous crops of hay, etc., to San Francisco and other bay points.

[illegible] — Court House at Napa. Napa is the county seat of Napa County, and has a population of 6,000. The city is located in the center of the beautiful Napa Valley, world-famous for its fruits, grapes and wines.

[illegible] — River steamer at dock on Napa River.

[illegible] — Napa Tan Shoe Factory, in Napa.

[illegible] — Looking across the Court House plaza in Napa, in the business section, with Masonic Temple in center of block.

[illegible] — California Glove Company's Factory, in Napa.

Napa, similar to Petaluma, Santa Rosa and other cities in this vicinity, has a great many large wineries, also factories turning out shoes, gloves, shirts and other wearing apparel. All these plants are lighted and operated by electricity.

KEY TO
ILLUSTRATIONS

Upper Left: NORTHWESTERN Pacific Railway Depot, Santa Rosa. Santa Rosa is the county seat of Sonoma County, and has a population of 8,000. It is on the line of the Northwestern Pacific Railway, Napa junction branch of the Southern Pacific and the Petaluma-Santa Rosa Electric Railway.

A portion of the territory surrounding Santa Rosa, similar to Petaluma, is adapted to extensive poultry raising. Santa Rosa shipped, during the year 1909, 1,436,160 dozen eggs. The total number of laying hens in Sonoma County is 2,500,000.

Upper Right: Gas Works and sub-station property, Santa Rosa. The gas works has a daily capacity of 600,000 cubic feet, and current for the sub-station is received from the Bay Lines, via Cordelia.

Left Center: In the Gas Work's yard, Santa Rosa, showing scrubbers in the open.

Right Center: The Carnegie Library, Santa Rosa.

Lower Left: New Sonoma County Court House, one of the finest municipal buildings in the State. This is a class "A" building, and is fire proof even to the interior fixtures.

Lower Right: One of the experimental gardens of Luther Burbank, the world-famous horticulturist.

KEY TO ILLUSTRATIONS

Upper Left: STREET scene in Petaluma, Sonoma County, looking toward the business center, and showing on the left one of the interurban electric cars of the Petaluma and Santa Rosa Electric Railway system.

Upper Center: Brooder house and white leghorn chickens, at one of the large poultry ranches in the vicinity of Petaluma.

Upper Right: View across the rolling hills in Sonoma County, typical of the thousands of poultry ranches in this section.

Petaluma is world famous for the amount of poultry and eggs shipped per annum; the figures for 1909 being as follows--120,018 and 7,159,481 dozens respectively. The larger incubators and brooders in this vicinity are now heated with gas, taken from the high pressure line which extends from Santa Rosa to Petaluma.

Left Center: Warehouse and Cold Storage Plant of the Western Refrigerating Company in Petaluma. This entire property was formerly the steam generating plant of the Petaluma District of the Pacific Gas and Electric Company.

Center: Electric sub-station in Petaluma, showing on the right three of the high pressure tanks used for the storage of gas received over the high-pressure line from Santa Rosa.

Right Center: Main business street in Petaluma, Sonoma County, which has a population of 6,000 and is a thriving business town on the California Northwestern Railroad.

Petaluma is also connected with San Francisco by river steamers, which operate in conjunction with the Petaluma and Santa Rosa Electric Railway system.

Lower Left: Golden Eagle Flour Mills, Petaluma, with office building in the foreground.

Lower Center: River steamers at dock on the Petaluma River.

Lower Right: Carlson-Currier Silk Factory in Petaluma. This concern manufactures all lines of silk threads.

Petaluma is also favored with large wineries and overall factories, canneries, an immense incubator factory, and several other large industrials.

KEY TO
ILLUSTRATIONS

Upper Left: NEW concrete sub-station in San Rafael, Marin County, which cares for the lighting and power load of that district. The current for this station is received over the branch line, which leaves the main Bay Lines at Cordelia, Solano County.

Upper Right: The new 100,000 cubic ft. gas holder at San Rafael, showing gas works property in the distance. This plant has a daily capacity of 600,000 cubic feet.

Left Center: Steel structure, now being erected to replace the old gas works building in San Rafael.

Center: Gas scrubbers at the Gas Works, San Rafael.

Right Center: Ferry slips and hill residence district of Sausalito, Marin County, opposite San Francisco. Sausalito is the bay terminus of the N. W. Pacific Railroad, the North Shore Electric Railroad, and is also the terminus of a branch transmission line, which leaves the main Bay Lines at Cordelia, Solano County.

Lower Left: County Courthouse at San Rafael. San Rafael is the county seat of Marin County, and has a population of 6,000. It is practically a suburb of San Francisco; a portion of the population being made up of San Francisco business men and their families, who have established themselves in beautiful homes in this locality.

Lower Center: Typical residence street scene in San Rafael.

Lower Right: The main business street of San Rafael.

KEY TO
ILLUSTRATIONS

Upper Left: THE steel tower located on the hill on the south shore of Carquinez Straits, near Crockett, known as the South Tower Station. This tower sustains the south ends of the four cables of the Bay Lines, which cross the straits at this point and terminate in Oakland.

Center: Lower of the two towers at Dillon's Point, on the north shore of Carquinez Straits, opposite Crockett, which sustain the above mentioned lines.

Upper Right: Aerial switching station at what is known as the Temescal sub-station, in the city of Oakland.

Lower Left: New concrete sub-station at Chico, Butte County, during the course of construction.

Right Center: Pole of the main Bay Lines, showing method of trimming trees, so as not to interfere with transmission lines passing over them.

Lower Right: Carquinez Straits, looking north from Crockett, showing the high tower at Dillon's Point, on the north shore of the straits, which carries the four cables of the Bay Lines. The north shore of the straits at this point, being considerably lower than the south shore, it was necessary to erect a steel tower 224 feet high, to bring these cables above the highest ship's mast in the world, when passing under the cables at high tide. These cables at the lowest sag in the center, are 206 feet above the water. The cables are $\frac{1}{8}$-inch in diameter, made of steel, and carry 60,000 volts.

KEY TO
ILLUSTRATIONS

Upper Left: SAN PABLO Rock Quarry near Richmond, Contra Costa County.

Upper Center: Section of Standard Oil Company Refining Works at Richmond.

Upper Right: Front of the Richmond sub-station, Richmond, where the transmission lines enter the station.

Center: General view of the Standard Oil Plant, Richmond.

Lower Left: Shipping point for the rock quarries near Richmond.

Lower Center: Winery and storage warehouses of the California Wine Association, Winehaven, Contra Costa County.

Lower Right: General view of the Richmond sub-station, through which current is supplied to the city of Richmond and adjacent territory. This district is supplied from the main Bay Lines, extending into Oakland.

SUBSTATION known as the Ridge sub-station, located on the hills back of Berkeley, Alameda County. The current for this station comes in over the main Bay Lines, which cross the Carquinez Straits, and terminate in Oakland.

REAR view of Ridge sub-station, back of Berkeley, showing Berkeley and Oakland in the distance.

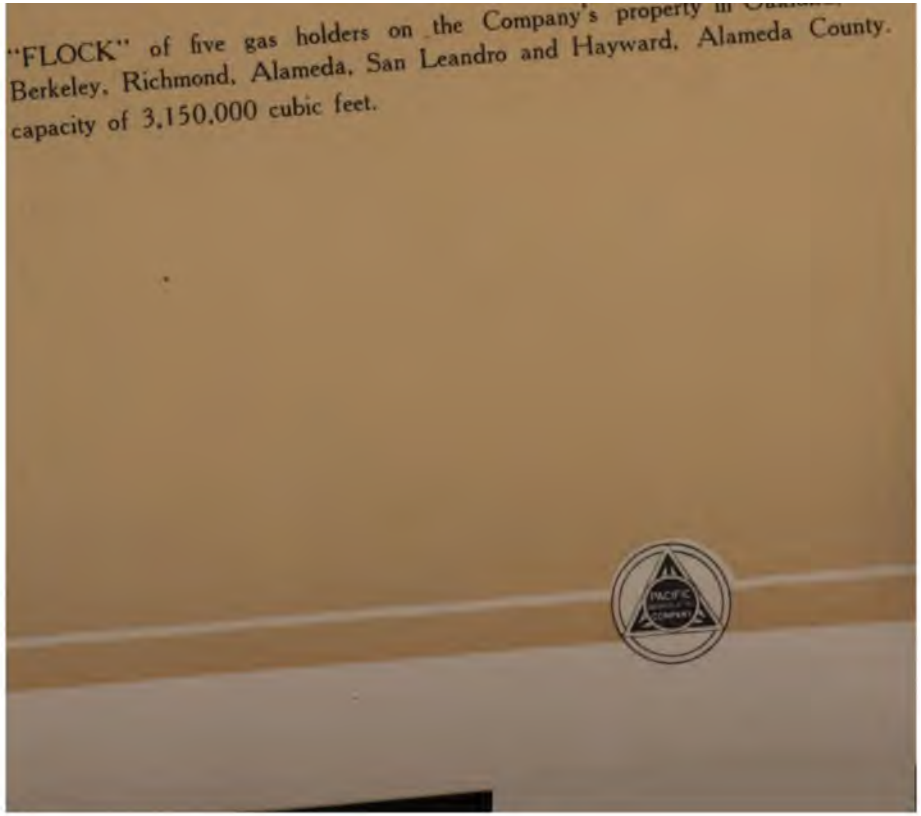
This illustration shows the method of bringing the current from the 60,000 volt lines into the station. The switches for breaking the current, when desired, are on the short poles immediately back of the station.

The porcelain insulators on the large poles in this illustration, over which the wires pass, are made up of three sections cemented together; the diameter of the largest section being 16 inches. These insulators are specially made to carry the high 60,000 voltage.

REAR view of Ridge sub-station, back of Berkeley, showing Berkeley and Oakland in the distance.

This illustration shows the method of bringing the current from the 60,000 volt lines into the station. The switches for breaking the current, when desired, are on the short poles immediately back of the station.

The porcelain insulators on the large poles in this illustration, over which the wires pass, are made up of three sections cemented together; the diameter of the largest section being 12 inches. These insulators are specially made to carry the high 60,000 voltage.



"FLOCK" of five gas holders on the Company's property in [illegible] Berkeley, Richmond, Alameda, San Leandro and Hayward, Alameda County. capacity of 3,150,000 cubic feet.

A "FLOCK" of five gas holders on the Company's property in Oakland, from which gas is supplied to Oakland, Berkeley, Richmond, Alameda, San Leandro and Hayward, Alameda County. These holders have a combined capacity of 3,150,000 cubic feet.

KEY TO
ILLUSTRATIONS

Upper Left: LAKE MERRITT, Oakland, Alameda County, looking toward the foothill residence district.

Upper Center: Electric lines of the Oakland Traction Company in the foothill district of Oakland.

Upper Right: The Country Club in Piedmont Heights, a suburb of the City of Oakland.

Left Center: Key Route Inn, Oakland, showing the covered depot, built in conjunction with this famous hotel.

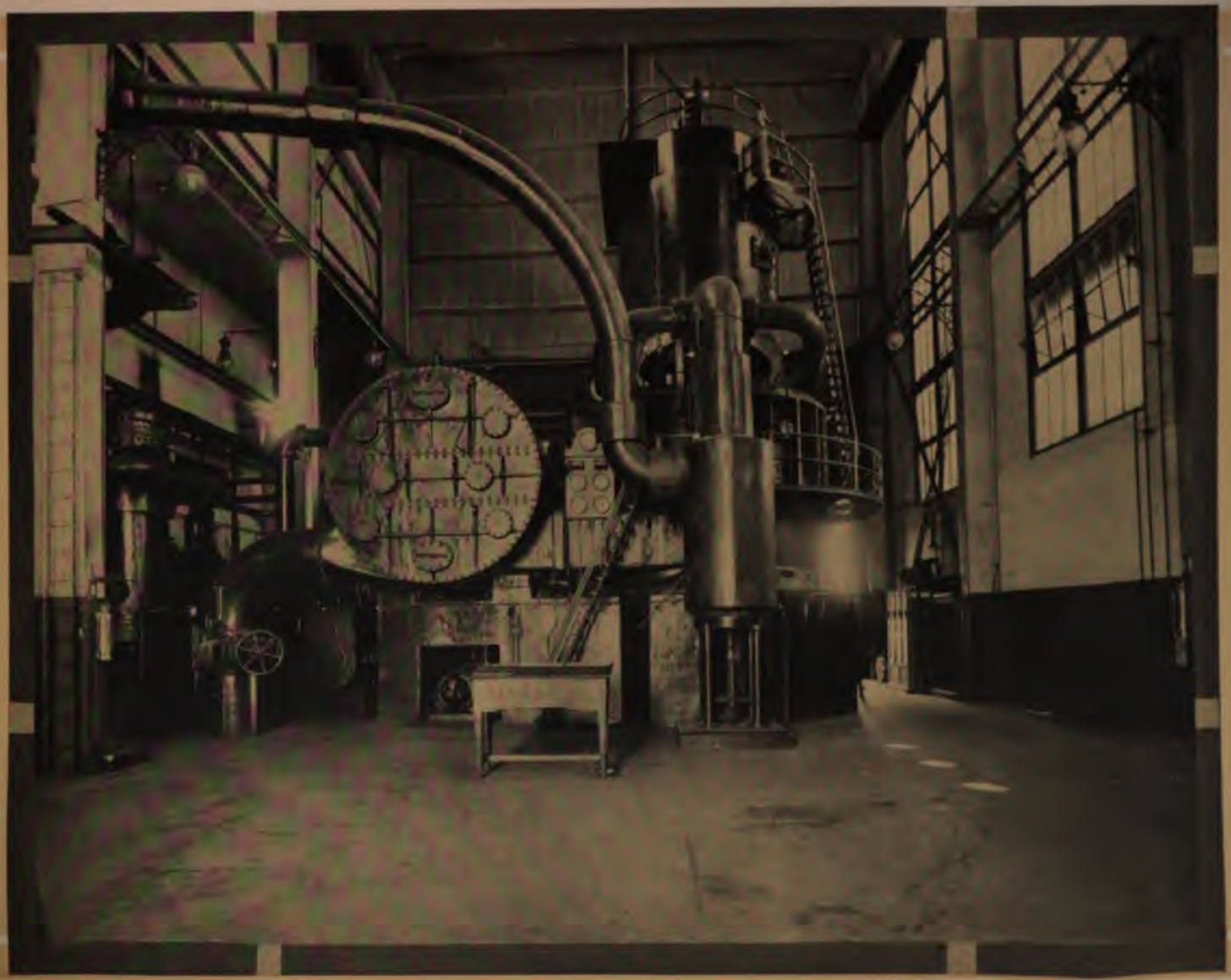
Right Center: Bird's-eye view of Oakland from the business center, looking toward residence district.

Lower Left: Broadway, Oakland. Oakland, Alameda County, has a population of 225,000, and is the second largest city on San Francisco Bay. Oakland has experienced a phenomenal growth the last five or six years, both in the business and residence sections, and is in close rivalry with the other large cities of the Pacific Coast.

Lower Center: First National Bank Building, Oakland, at the intersection of Broadway, Fourteenth, San Pablo and Telegraph Avenues.

Lower Right: In the residential section of Oakland, which is made up of beautiful villas, cottages and artistic bungalows, set in large and beautifully arranged gardens, which abound in flowers and semi-tropical shrubbery the year round.

STEAM turbine generator in Station "C", Oakland. This generator has a capacity of 9,000 K. W., and is an auxiliary for the Oakland District.



KEY TO
ILLUSTRATIONS

Upper Left: PACKING House of the Oakland Meat Company at West Berkeley, Alameda County.

Upper Right: Byron Jackson Iron Works, Berkeley.

Left Center: Municipal pumping plant on the shores of Lake Merritt, Oakland. This plant was recently installed by the City of Oakland, to furnish a high-pressure salt water system for fire protection.

Center: Office of the Oakland district of the Pacific Gas and Electric Company.

Right Center: J. J. Pfister Knitting Mills, Oakland.

Lower Left: Van Emon Elevator Company, Berkeley.

Lower Right: Electric Stations "A" and "B", Oakland, with 2,000,000 cubic ft. holder on the left.

KEY TO
ILLUSTRATIONS

Upper Left: BOILER room in turbine Station "C," Oakland. This is an auxiliary plant, having eight boilers of 750 H. P. each.

Upper Center: Ridge sub-station on hillside back of Berkeley. This is a transformer station on the main 60,000 volt Bay Lines, which terminate in Oakland.

Upper Right: Intake pipe, 42 inches in diameter, through which water is pumped and used in the condensing of steam at Station "C."

Center: Turbine generator in Station "C," Oakland. This station has an installed H. P. of 12,066, and the current generated is supplied to the Oakland District, in conjunction with the current received from the main Bay Lines, and the Standard Lines—via the branch from Mission San Jose.

Lower Left: Rear view of Gas Station "B," Oakland, taken from the water front. This station is the largest of the Company's gas works, excepting that in San Francisco. It has a daily capacity of 9,200,000 cubic feet, and the holders adjoining this station have a combined capacity of 3,500,000 cubic feet.

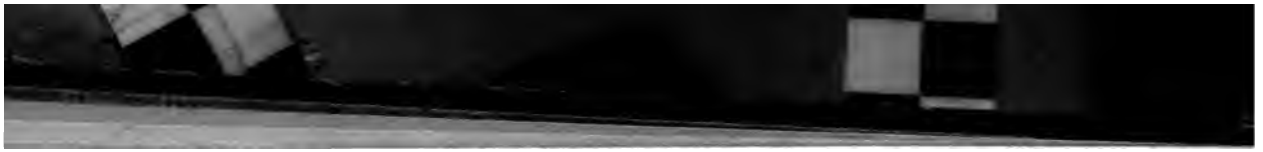
Lower Center: Electric sub-station in the city of Berkeley, through which the lighting and power loads for that district are regulated. The current for this station is received from the Bay Lines through the Ridge sub-station, and also from Station "C," above mentioned.

Lower Right: Exteriors of Electric Stations, "A," "B" and "C," Oakland. These stations adjoin, and are designated as above, for ready reference.

Station "A" contains the transformers, necessary in the reduction of the 60,000 volt current into lesser voltages, for the lighting and power loads.

Station "B" contains the motor generator sets, and other apparatus for changing the alternating current to direct current, for the street railway systems, elevators, etc.

Station "C" is a turbine generating station, as above described.



BOILER room in turbine electric Station "C," Oakland. This plant has a bank of 8,750 H. P. boilers. The feed water for these boilers is pumped from a well on the property, and the necessary water for condensing the steam, used by the turbine, is pumped from the bay through a 42-inch diameter pipe.

CALIFORNIA Fruit Canners Association packing house, on First Street, Oakland, Alameda County.

One of the large warehouses at Posen station, near the water front, West Oakland, on the main lines of the S. P. R. R.

Broadway, the main business street of Oakland, looking east from Twelfth Street. A number of large new class "A" bank and business blocks have been erected in Oakland in the last three or four years. Two of these are shown on the right of this illustration.

Phœnix Iron Works, Oakland.

United Iron Works, Oakland.

Oakland has numerous large iron and wood-working factories, located near the water front; these cuts being representative of this class of industrials.

INSIDE of the meter shop at Gas Station "B," Oakland, where the gas meters for Oakland and a number of the other districts of the company are repaired. Thirty-two men are regularly employed on this work. The San Francisco [illegible] has a separate meter shop in San Francisco, and employs 25 men, repairing the meters for its 74,990 gas consumers in San Francisco.

[redacted]

[illegible]

[illegible]: ONE of the numerous packing houses of the California Fruit Canner's Association throughout California. This establishment is equipped to care for all stages in the preparation of fruits and raisins produced in Fresno County.

[illegible]: View of an irrigated vineyard in Fresno County, showing one of the laterals that supply water during the warm summer months.

[illegible]: Packing house of the Pacific Coast Seeded Raisin Company, in Fresno, where the grapes are seeded and packed for shipment throughout the world.

[illegible]: In the residence district of Fresno, looking down the beautiful shaded avenues which are characteristic of the entire city.

[illegible]: Court House at Fresno, with a view of plaza, that surrounds this building. Fresno is located in Fresno County, in the southern part of the San Joaquin Valley, and has a population of 35,000. It is on the lines of the Southern Pacific and Santa Fe railroads. During 1910 Fresno shipped to all parts of the world, 1,497 cars of fresh and dried fruits and 2,750 cars of raisins and grapes. There is also produced in Fresno County each year about 5,950,000 gallons of wine.

[illegible]: Street scene in the main business portion of Fresno.

[illegible]: One of the numerous cross streets intersecting the main business street of Fresno.

[illegible]: Gas Works of the Pacific Gas and Electric Company in Fresno, which has a capacity of 2,000,000 cubic feet of gas per day.

[illegible]: One of the numerous drying yards, adjoining the fruit packing houses in Fresno, showing the process of drying peaches, apricots, prunes and other fruits on trays. Thousands of girls and boys flock to Fresno during the summer vacation season, to assist in the tremendous task of caring for the great crop of fruit, which must be packed and prepared for shipment as it ripens, under the rays of the warm summer sun.

RIVERSIDE view of Electra Power House on the river side, showing the water as it is thrown off from the wheels into the Mokelumne River.

EXTERIOR view of Electra Power House on the river side, showing the water as it is thrown off from the wheels into the Mokelumne River.

TIGER CREEK SAWMILL, where the lumber is obtained for the up-keep of the Amador and Standard flumes of the Electra system.

KEY TO ILLUSTRATIONS

Upper Left: FIRE drill at Electra, Amador County, which property, similar to all others of the Company, is thoroughly equipped with up-to-date hose lines and fire extinguishing apparatus. In this picture is also shown the four-horse stage belonging to the mail line operating between Jackson and Electra.

Upper Right: Bird's-eye view of Electra Power House and other buildings, showing on the right, main pipe lines which extend from the penstock, 3,278 feet above the power house, and carry the water supply to operate the seven units with a total of 26,810 H. P. capacity. This power house is located on the Mokelumne River, eight miles from the town of Jackson, the power lines from which traverse Amador, Calaveras and San Joaquin Counties to the Stockton sub-station, where the line branches, with a leg west to Herdlyn, Antioch, Black Diamond, Martinez, Port Costa and South Tower. Here it joins the Bay Lines. An extension runs south from Herdlyn to Newman. The main line extends southwest from Stockton, through San Joaquin and Alameda Counties, to Mission San Jose sub-station. Here the line again branches with a leg north to Station "B," Oakland, where it is connected, when desired, with the main Bay Lines coming from the north. The main line continues from Mission San Jose to Mountain View sub-station, with a leg south to San Jose and adjacent territory, another south from Mountain View to the Cement Works at Davenport, thence to Santa Cruz, Watsonville and Hollister, San Benito County; the main line extending north, traversing the San Mateo Peninsula and terminating in San Francisco. These lines carry 60,000 volts.

Left Center: Main headquarters house at Electra, for use of the superintendent and power house operatives. This building can best be described by a likeness to an ideal country home, with its wide rose-covered veranda, large living and dining rooms, open grates, and its commodious and airy sleeping rooms in the second story.

Center: View of Forebay Reservoir on the mountain above Electra Power House, used as a storage and regulating reservoir in conjunction with the water supply for that power house.

Right Center: Old frame building constructed over the site selected for the original Electra Power House. The old power house was destroyed by fire, which resulted in the removal of the Electra Power Plant about four miles farther up the Mokelumne River, where a more satisfactory location was found, and which afforded a higher head for the generating plant.

Lower Left: Tabeaud Reservoir on the mountain above Electra Power House, a storage reservoir into which the Standard Canal empties. This reservoir has a capacity of 50,425,000 cubic feet, is confined by next to the highest earth dam in the world, and also acts as a storage and regulating reservoir for the water supply for the towns of Jackson and Sutter Creek in Amador County, and that used in the mines in that section.

Lower Right: Swimming pool on the lower floor of the Employee's Club House at Electra.

KEY TO ILLUSTRATIONS

Upper Left: PINE tree in the forests adjacent to the Tiger Creek Sawmill in Amador County, showing a lone Norway weeping fir, foreign to this section, and of unknown origin.

Upper Center: Log-hauling car on the rail line for the transporting of logs to the Tiger Creek Sawmill.

Upper Right: Donkey engine in the forest surrounding the Tiger Creek Sawmill, which, by the use of cables, drags the logs to the rail line.

Center: Lumber yard located three miles below the Tiger Creek Sawmill, at which point is stored approximately 2,000,000 feet of lumber, which is thrown into the canals leading to the Electra Power House, and picked up where needed and used in repairing the flumes on the canals.

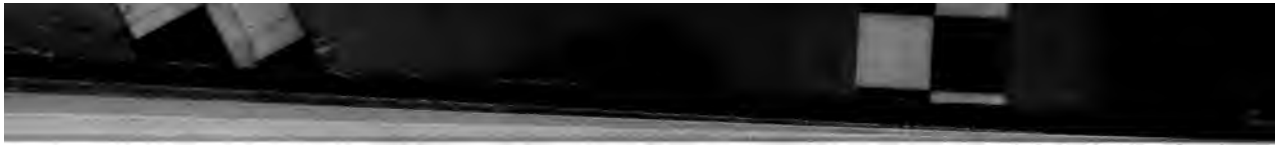
Lower Left: Bird's-eye view of the Tiger Creek Sawmill, showing the tramway from which lumber is loaded for transportation to the main lumber yard on the canals.

Lower Center: Tiger Creek Sawmill, which has a capacity of 50,000 feet per day. This is a wet-log sawmill and is operated by this Company during the summer months, for the sawing of timber to be used in the flumes along the canals, feeding water to the Electra Power House.

Lower Right: In the big tree pine forests, surrounding the Tiger Creek Sawmill.

LAKE TABEAUD, above the Electra Power House, showing dam on farther side of lake.

LAKE TABEAUD, above the Electra Power House, showing dam on farther side of lake.



WHERE the timber from the Tiger Creek Sawmill is stored, ready for transportation via canals, and used in repairing flumes.

[illegible] end of armature frame belonging to one of the 5,500 K. W. generators in the Electra Power House.

[illegible] for water wheel and generator to be used in a new 5,500 K. W. unit recently installed in the Electra Power House.

[illegible] water wheel for the No. 7 unit in Electra Power House, with the hood removed showing the buckets as arranged on the wheel.

[illegible] transporting by 16 horse team, one of the 5,500 K. W. generators for the Electra Power House.

[illegible] governor needle regulating control for No. 6 water-wheel unit in the Electra Power House.

Another view of the 16-horse team, hauling generator into Electra.

PUMPING Plant No. 1, Stockton Water Company, Stockton.

KEY TO ILLUSTRATIONS

Upper Left STOCKTON Substation, Stockton, San Joaquin County, through which the lighting and power load of the City of Stockton is regulated. This power house receives current from the main Standard Lines from Electra.

Upper Center Pumping Plant No. 2 of the Stockton Water Company. This is a concrete building with red tile roof, mission style, and is equipped with two pumps, having a capacity of 4,500,000 gallons per 24 hours, which are operated by electric motors. The water is pumped from four deep wells, located on the Company's property surrounding this station.

Upper Right The main business street in the City of Stockton. Stockton is the county seat of San Joaquin County, has a population of 25,000 and is one of the oldest cities in the State. It is on the lines of the Western Pacific, Southern Pacific and Santa Fe Railroads, is the western terminal of the Sierra Railway, and is also connected with Sacramento, the State Capital, with a suburban electric line. Stockton is the principal shipping point for the great farming district of the San Joaquin Valley.

Center Bird's-eye view of the City of Stockton, taken from the water front on the San Joaquin River. River steamers operating between Stockton, San Francisco and intermediate points, furnish Stockton with a daily water service with the San Francisco Bay Cities.

Lower Left Steam pumping plant No. 1 of the Stockton Water Company. This plant is equipped with two pumps, having a capacity of 10,500,000 gallons per 24 hours. The water is pumped from fourteen deep wells, located on surrounding property belonging to the Company. In the yard back of this station there is a reservoir, which will hold 1,250,000 gallons, and in addition thereto, there is a steel tank holding 200,000 gallons, erected on a steel tower 110 feet high, which creates the necessary pressure for the water distributing system and for fire purposes.

Lower Center San Joaquin County Court House, Stockton.

Lower Right The new Stockton Hotel which has just been completed, at an expenditure of $500,000. This hotel is first-class in every feature and has supplied Stockton with a hostelry surpassed by none in the interior of the State.

GAS

KEY TO ILLUSTRATIONS

Upper Left: WATER front at Antioch, Contra Costa County, on the San Joaquin River, just above its entrance into San Francisco Bay.

Upper Right: The plant of the California Paper and Board Mills, near Antioch.

Left Center: Street scene in Antioch, which town has a population of 3,000 inhabitants. The light and power load for this district is supplied from the Standard Lines. Antioch is on the line of the Southern Pacific and Santa Fe Railroads.

Right Center: Bales of scrap paper stored away ready for conversion into new paper, at the mills above mentioned.

Lower Left: Plant of the Holland Sandstone Brick Company, near Antioch.

Lower Right: Bowers Rubber Works, just outside of Antioch.

The manufacturing concerns above mentioned are electrically operated.

KEY TO
ILLUSTRATIONS

Upper Left: WATER front at Antioch, Contra Costa County, on the San Joaquin River, just above its entrance into San Francisco Bay.

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The manufacturing concerns above mentioned are electrically operated.

EXTERIOR of auxiliary Steam Generating Plant in San Jose.

20

KEY TO ILLUSTRATIONS

Upper Left: AUXILIARY Steam Generating Plant in San Jose, Santa Clara County. This plant was built and operated by the old United Gas and Electric Company, and the plant is now used only as an auxiliary. Adjoining this plant is a sub-station supplying the City of San Jose, street car lines, etc., with current received from the Standard Lines, coming from Electra Power House.

Upper Right: Gas Works at San Jose, showing the new 500,000 cu. ft. holder recently constructed. This plant has a capacity of 1,600,000 cubic feet per day.

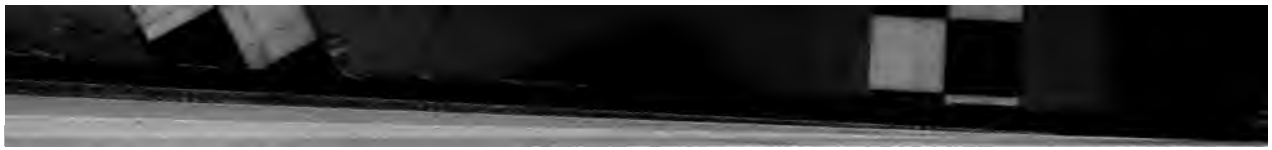
Left Center: Court House and City Hall, San Jose, which is a beautiful building constructed of stone, and modeled after the Corinthian period.

Center: The new up-to-date office building, in the first floor corner of which are located the offices of the San Jose District of the Pacific Gas and Electric Company. This office has only recently been removed to this point, and is very artistically and intelligently arranged to meet the Company's needs.

Right Center: A portion of the interior of auxiliary power plant, above described.

Lower Left: Hotel Vendome, looking across the beautiful grounds which surround this famous hostelry.

Lower Right: San Jose is known throughout the world as the "Garden City", and well deserves this pleasing appellation, due to its beautiful public squares, artistic homes, and avenues lined with magnificent shade trees. Street scene in the business center of San Jose, which city is situated in the heart of the beautiful Santa Clara Valley, 52 miles south of San Francisco, on the coast line of the Southern Pacific Railroad. San Jose has a population of 40,000 and is steadily growing. It is the shipping point for the enormous crop of fruit, garden truck, berries, etc., annually produced in the Santa Clara Valley, and which valley is also noted for its great seed farms, which are among the largest in the world.



GAS Generator Building in San Jose, showing the new 500,000 cubic feet holder on the left.

THE Mountain View Sub-station of the Pacific Gas and Electric Company, Mountain View, Santa Clara County. This station is the premium sub-station of the Company, not only due to the ideal and up-to-date installation of apparatus contained therein, but also on account of the pride displayed by the operatives at this station in the exterior upkeep and adornment of the property.

KEY TO
ILLUSTRATIONS

Upper Left: EBERHARD Tanning Company near Santa Clara, Santa Clara County.

Upper Right: Libby, McNeal and Libby Canning and Packing House at Sunnyvale, Santa Clara County.

Left Center: Mountain View sub-station near Mountain View, Santa Clara County, through which the lighting and power loads of the vicinity are regulated, and from which point the branch line for Santa Cruz leaves the main Standard Lines.

Right Center: Interior of the Mountain View sub-station, showing switchboards, etc.

Lower Left: Incubator factory, Sunnyvale, Santa Clara County.

Lower Right: Joshua Hendy Iron Works, near Sunnyvale. All these industries are served with electricity from the main Standard Lines extending from Electra Power House, Amador County, to San Francisco.

INTERIOR of Mountain View Sub-station, showing regulators on the left, switch-board in the center, and bank of transformers on the extreme right. In this cut is also shown the systematic arrangement of fire apparatus at one of the fire stations in this sub-station, and which is representative of protection given the Company's properties. This fire station consists of one three gallon chemical extinguisher, six dry powder extinguishers and a nest of three fibre buckets containing dry sand, which is used in smothering possible electrical fires.

KEY TO
ILLUSTRATIONS

Upper Left: WEST end of Inner Quadrangle, Stanford University. This university is located near Palo Alto, in Santa Clara County, on the coast line of the Southern Pacific.

Upper Right: Memorial Court, Stanford University.

Center: Palo Alto sub-station, through which the electric energy is regulated for the lighting and power loads and the street railway system of Palo Alto.

Lower Left: Row of Fraternity Houses at Stanford University.

Lower Right: Sorority Houses at Stanford University.

ONE of the numerous canneries of the California Fruit Canners Association, located near Redwood City, San Mateo County.

...ubset of the Peninsular Railway Company, which operates a system of electric cars through the Santa Clara Valley.

...Substation Plant of the Seventh Day Adventists, near Mountain View, Santa Clara County.

...ic Gas and Electric Company's substation at Redwood City, with the old power plant and high tower, which carries ...n transmission wires across the channel.

...Southern Railway sub-station at the Santa Clara County.

...acific Gas and Electric Company substation, San Mateo, San Mateo County.

...old works on the west side of the S. P. R. R. near San Mateo, San Mateo County. The salt prepared at this works is ...ained by the operation of water from San Francisco Bay.

KEY TO ILLUSTRATIONS

Upper Left: KEARNY STREET, San Francisco, looking north from Market Street, showing the Chronicle Building on the right.

Upper Center: Market Street, San Francisco, looking west from the Ferry Building, showing the north side of the street, and the four lines of street railway on this thoroughfare.

Market Street is the main artery of the city. It extends diagonally across the town, southwesterly from the Ferry Building, and practically all street car lines enter Market Street from the different diverging streets and avenues and complete their trips at the Ferry.

Upper Right: The south side of Market Street, looking east from Grant Avenue toward the water front. The first building on the right is to be the new home of the San Francisco Examiner, next to which is the Monadnock, (a general office building), the Palace Hotel, Metropolis Bank Building and the Balboa office building.

Center: View of a portion of the new business district of San Francisco, looking north from Market Street toward the bay, showing a portion of Telegraph Hill on the left.

Lower Left: Looking west on Post Street at its intersection with Market Street. The Crocker Building is shown in the center of this illustration.

Lower Center: Powell Street, looking north from Market Street, through the hotel district.

Lower Right: Geary Street, looking west from its intersection with Market Street.

KEY TO
ILLUSTRATIONS

Upper Left: ONE of the new fire houses in San Francisco.

Upper Center: The new United States Custom House, San Francisco.

Upper Right: The Federal Appraisers' Building. San Francisco. This building survived the fire of April 18, 1906.

Center: The Ferry Building at the foot of Market Street, San Francisco. All transcontinental and rail lines from the north and east, transport their passengers across San Francisco Bay by ferries, which land at the piers at this point. The State Board of Trade and the California Development Board have their offices, and maintain exhibits in the upper stories of this building.

Lower Left: The new Hall of Justice on Kearny Street, San Francisco.

Lower Center: General Post Office, Seventh and Mission Streets, San Francisco.

Lower Right: Another of the new fire houses in San Francisco.

KEY TO
ILLUSTRATIONS

Upper: UNION IRON WORKS, located on the Bay Front, Potrero District, San Francisco. This plant employs about 3,000 men, and is the largest private ship building works on the Pacific Coast. Almost all the machinery in this enormous plant is electrically operated. It is also perfectly equipped to manufacture the largest types of engines, boilers and general steam-generating apparatus.

Left Center: View along the water front, which conveys a general idea of the shipping of this port.

Upper Center: Fulton Iron Works, North Beach, San Francisco. This concern carries on a general iron works and ship building business.

Lower Center: California Barrel Company's plant, Potrero, San Francisco. Over the top of this building is shown the 1,000,000 cubic ft. holder of the Potrero Gas Works.

Right Center: Sugar Refineries, Potrero, San Francisco. This property adjoins that of electric Station "A", and the Potrero Gas Works of the San Francisco Gas and Electric Company.

Lower: Risdon Iron Works, San Francisco. It carries on a general foundry and ship building business. Practically all the machinery is operated by electricity, with a combined motor H. P. of 1,800. The grounds cover 33 acres. The Risdon Iron Works also makes a specialty of building gold dredges and general mining machinery.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

THE St. Francis Hotel, San Francisco, facing Union Square; showing the immense crowds on one of the gala days during a recent celebration. This park is on the first street to the rear of the Company's general offices.

[redacted]

Office of the General Manager of the San Francisco Gas and Electric Company.

[redacted]

Side view of the general offices of the Company, during course of construction.

[redacted]

Front view of the offices of the Company, on the south side of Sutter Street, just east of Powell. The St. Francis Hotel is shown on the right. On the lower floor of this building are the general offices of the San Francisco Gas and Electric Company. The upper floors are occupied jointly by the Pacific Gas and Electric Company and the San Francisco Company.

[redacted]

The first floor, general offices of the San Francisco Gas and Electric Company. The bust shown in this illustration is that of Mr. Peter Donohue, the founder of the first gas company doing business in San Francisco.

[redacted]

Office of the President and General Manager of the Pacific Gas and Electric Company.

[redacted]

Steel superstructure of Company's general office building, San Francisco. This view was taken at time of erection, 1909.

KEY TO
ILLUSTRATIONS

Upper Left: YARD of the Potrero Gas Works, showing three scrubbers in the foreground.

Upper Right: Pile of lamp black at the Potrero Gas Works. This lamp black is the only residual of the oil gas process, and is used as fuel under the boilers, and also for making water gas.

Center: The 1,000,000 cubic ft. storage holder at the Potrero Gas Works.

Lower Left: Potrero Gas Works showing scrubbers and purifiers in the foreground.

Lower Right: Four wooden purifiers at the Potrero Gas Works, having a capacity of 1,000,000 cubic feet, each 24 hours.

KEY TO ILLUSTRATIONS

Upper Left: MONTGOMERY Street, San Francisco, looking north from Market, toward Telegraph Hill. In the right foreground is the Metropolis Bank Building, and across Market Street, on the right, a glimpse of the Wells Fargo Nevada National Bank Building. In the left foreground is the Crocker Building, the Crocker National Bank occupying the first floor. Across Post Street on the left, is the new First National Bank Building.

Upper Center: A view of a portion of the hotel and business section of San Francisco, taken from the Fairmont Hotel, looking southeast toward the Bay.

Upper Right: Dupont Street, Chinatown. On the right is shown one of the numerous recently erected buildings, carrying out the oriental idea in architecture. The Chinese population of San Francisco is about 60,000. These quarters are the largest of their kind in the world.

Center: South side of Market Street, looking west from Kearny, with the Monadnock Building in the foreground, the Call Building and the Humboldt Bank Building in the distance. Market Street is the main thoroughfare of San Francisco. The recent United States census gives San Francisco a population of 416,912.

Lower Left: View of a portion of the business, hotel and residential section of San Francisco, taken from the top of the Call Building. The Fairmont Hotel is shown in the extreme center. Most all of the large buildings shown in this group are new and of class "A" construction.

Lower Right: California Street, looking east from Kearny Street, through the financial district, toward the bay. The large building on the right is the Merchants Exchange.

KEY TO
ILLUSTRATIONS

Upper Left: ARGONAUT HOTEL on Fourth Street, just south of Market Street. This is a representative commercial hotel, and is also the home of the local branch of the Travelers Protective Association of America. Total guest rooms 400.

Upper Center: Fairmont Hotel, on one of the highest hills in the city, California and Powell Streets. This building has 500 rooms and is a class "A" structure, first-class in appointments. The three entrances shown in the lower right of this picture, communicate by corridors, with elevators which carry guests to the upper floors.

Upper Right: Bellevue Hotel, corner Geary and Mason Streets, a new up-to-date family hotel of the first class. Total rooms 260.

Center: Palace Hotel, Market and New Montgomery Streets. This building is a new up-to-date, first-class hotel. It is built on the site of the old Palace Hotel, and the interior arrangements are almost identical with the old building. The Palace Hotel of San Francisco is so well known throughout the world, that further description is superfluous. Total rooms 700.

Lower Left: St. Francis Hotel, corner Geary and Powell Streets. The park in the foreground is Union Square. This building has 600 guest rooms, and is twelve stories in height, class "A" and first-class in every particular.

Lower Center: The Majestic, Dorchester and Normandie Hotels on the northwest, northeast and southeast corners of Sutter and Gough Streets, respectively. These are representative first-class family hotels.

Lower Right: Keystone Apartments, Hyde and Washington Streets. This building contains 420 rooms, and without doubt is one of the finest and most modern apartment houses on the continent. The apartments are in suites of four, five, six and seven rooms.

MAP OF THE CITY
OF
SAN FRANCISCO
CALIFORNIA
SHOWING
ELECTRIC DISTRIBUTING SYSTEM
OF
SAN FRANCISCO GAS AND ELECTRIC CO
POPULATION
PACIFIC OCEAN
BAY OF SAN FRANCISCO

MAP of the City and County of San Francisco, showing the gas distributing system of the San Francisco Gas and Electric Company, a subsidiary of the Pacific Gas and Electric Company.

The gas supplied to this system is generated at the Potrero Gas Works, and distributed from that point through high and low pressure mains to all parts of the city. The commodity supplied is oil and water gas, with a standard of 19 candle-power.

KEY TO ILLUSTRATIONS

Upper Left: GERMAN Savings and Loan Society on California Street, San Francisco. This institution owns its own bank building, which has been recently reconstructed, and arranged to better meet the requirements of this large and growing savings bank.

Upper Center: Crocker National Bank, Market, Montgomery and Post Streets. This bank occupies the entire first floor and basement of the Crocker Building. It has been completely reconstructed since 1906, and combines within its walls the latest innovations in modern banking.

Upper Right: French Savings Bank on Sutter Street near Montgomery. There is a safe deposit department in the basement.

Lower Left: Bank of Italy, Montgomery and Sacramento Streets, carries on a general savings bank business; its clients being drawn principally from the Latin-American people in the North Beach district.

Lower Center: First National Bank Building, on the first floor of which is the First National Bank of San Francisco. This building is new, and of class "A" construction, the upper floors being devoted to general office purposes.

Lower Right: Union Trust Building, Montgomery and Market Streets; on the lower floor is located the Wells Fargo-Nevada National Bank. This institution carries on a general commercial and savings bank business. The upper floors of this building are devoted to offices.

Upper Left Electric sub-station "L," Mariposa and Vermont Streets, San Francisco. This is a very important switching station, in addition to which it supplies power and lighting to a large manufacturing territory.

Upper Center Station "C," on First near Third Street, in the heart of the business section of San Francisco, is a sub-station for the [illegible] and distribution of a portion of the lighting and power loads, and is also equipped with a large storage battery of 1,344 cells which can be drawn against when additional current is required.

Upper Right. Station "A," corner Spear and Folsom Streets, San Francisco, which cares for the water front load, and is also tied in with the general distributing system of the city. This station has an installed H. P. of 8,500.

Left Center. Electric sub-station "B," Townsend, between Second and Third Streets, is a direct current sub-station, supplying light and power to a manufacturing district, and also to the large terminal warehouses, in the vicinity of the railway yards and the water front.

Center The Fern Avenue entrance to Electric sub-station "D," Fern Avenue, between Polk and Larkin Streets. This is the main source of supply to a large part of the Western Addition of San Francisco; a territory in which there are many fine large apartment houses and residences.

Right Center. Station "A," Potrero, the main generating plant for the City and County of San Francisco. This station is also tied in with the main Standard Lines from Electra, through Martin Station.

Lower Left. Station "J," Eighth, near Mission Street, is a sub-station through which the lighting and power loads of a portion of the city is supplied. This station, similar to Station "C," has a very large storage battery.

Lower Center. Electric sub-station "G," Ellis and Broderick Streets, is the newest of the San Francisco sub-stations. It supplies lighting and power to the Park and Sunset districts.

Lower Right: Electric sub-station "J," Sacramento, near Montgomery Street, which supplies lighting and power to the financial district, and a portion of the wholesale and water front districts.

These sub-stations are located at various points in the city, in order to supply the demands of the lighting and power loads in their immediate vicinity. The location of the sub-stations and the distance between them, is determined according to the density of load in the territory, which they supply.

KEY TO
ILLUSTRATIONS

Upper Center: THE Buckingham-Hecht Shoe Factory, Valencia Street, San Francisco.

Left Center: Factory and warehouse of the American Steel and Wire Company, 16th & Folsom Streets, San Francisco.

Center: Wood-working plant of the Brunswick-Balke-Collender Co., 20th & Harrison Streets, San Francisco.

Right Center: Shirt and Overall Factory of Levi Strauss & Company, 15th and Valencia Streets, San Francisco. This concern originated the copper-riveted overall, which bears their name and trade mark, and is known in every part of the world.

Lower Left: Wood-working plant of L. and E. Emanuel Company, 12th and Mission Streets, San Francisco. This concern makes a specialty of interior and office wood finishing.

Lower Right: The Illinois Pacific Glass Company, Folsom and 15th Streets, San Francisco, where they manufacture all kinds of glassware, bottles, etc.

KEY TO ILLUSTRATIONS

Upper Left: BLOWER room, in Potrero Gas Works, San Francisco, where air is compressed for the oil gas generators.

Upper Right: Independent Gas Works, Potrero, where lampblack is used in the manufacture of water gas.

Lower Left: The rear end of Station "A", Potrero, and site of new 5,000,000 cubic ft. gas holder for the Potrero Gas Works; now under course of construction.

Lower Right: One of the large oil gas generators in the Potrero Gas Works, making gas at the rate of 150,000 cubic ft. per hour.

KEY TO
ILLUSTRATIONS

Upper Left: ADLER'S Sanatorium, Van Ness Avenue and Broadway, San Francisco.

Upper Center: Grace Episcopal Church, corner Bush and Gough Streets. This is a stone building, very beautiful in its exterior and interior architectural design.

Upper Right: First Unitarian Church, Franklin and Geary Streets. This edifice is known locally as the Starr King Church, having been founded by that eminent divine; in the left foreground is shown a miniature mausoleum in his commemoration.

Left Center: Congregation Emanu-El Temple on Sutter Street, near Powell; one of the several beautiful Hebrew houses of worship in San Francisco. This building was erected in 1864 and is one of the monuments of the city.

Center St. Mary's Cathedral, Van Ness Avenue and O'Farrell Street; representative of the many Catholic churches in the city. The Roman Catholic Archbishop, of this diocese makes his headquarters at this church.

Right Center Y. M. C. A. Building, Leavenworth Street and Golden Gate Avenue. The necessary funds for the erection of this magnificent building were raised by local contribution. This building contains an enormous swimming pool and athletic and educational departments.

Lower Left McNutt Hospital, Bush Street near Jones, San Francisco.

Lower Center St. Mary's Hospital, Hayes and Stanyan Streets, San Francisco. This is a Catholic hospital, conducted by the Sisters of Mercy.

Lower Right St. Francis Hospital, Bush and Hyde Streets. This is a privately conducted hospital.

All of these hospital buildings are first-class and fire proof in their construction, and equipped with all modern appliances in their operating rooms.

Upper Left: FACTORY of the Otis Elevator Company, North Beach, San Francisco.

Upper Center: Plant and warehouse of the D. Ghirardelli Cocoa and Chocolate Manufacturing Company, San Francisco. This concern was founded in the early 60's.

Upper Right: Rudgear-Merle Company, manufacturers of wire and art metal products.

Center: The San Francisco packing and warehouses of the California Fruit Canner's Association, located on the bay front, North Beach.

Lower Left: The American Can Company, San Francisco. This is one of the large manufacturing plants that supply the millions of cans used in the fruit industry of California.

Lower Center: Portion of Fisherman's Wharf, North Beach. This illustration depicts one of the unique sights to be seen in San Francisco, being the headquarters and market for the hundreds of Italian, Portuguese and Greek deep sea fishermen, who venture miles upon the Pacific Ocean with their small boats, for the supply of fish for central California.

Lower Right: View of freight yards of the Southern Pacific Company, San Francisco, for both incoming and outgoing freight handled over that road.

TO
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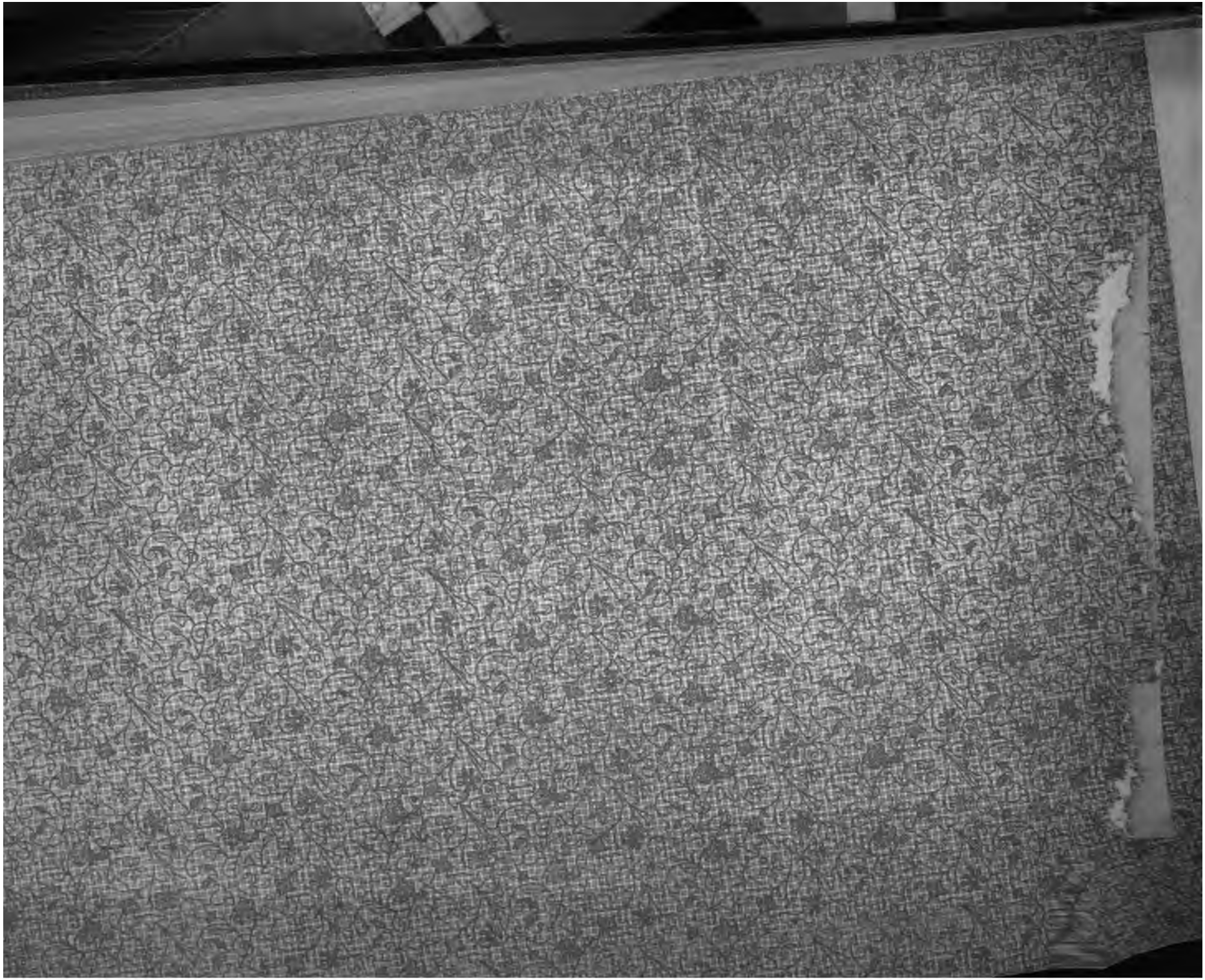
Right: View of freight yards of the Southern Pacific Company, San Francisco, for both incoming and outgoing freight handled over that road.